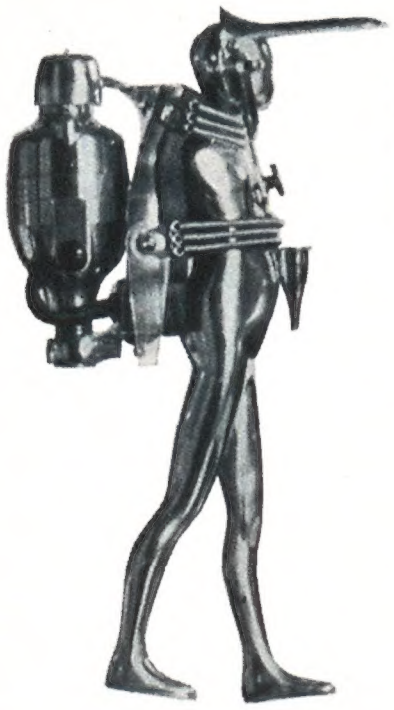
January 1972

# Smithsonian

A princely Minoan boxer of 1500 B.C.—
from first color report of a great
fresco discovery in island ruins (p. 14)

artist: trova



**The real**

During one summer week the air in Tokyo, Sydney, New York, Buenos Aires and Milan was officially unsatisfactory to breathe.

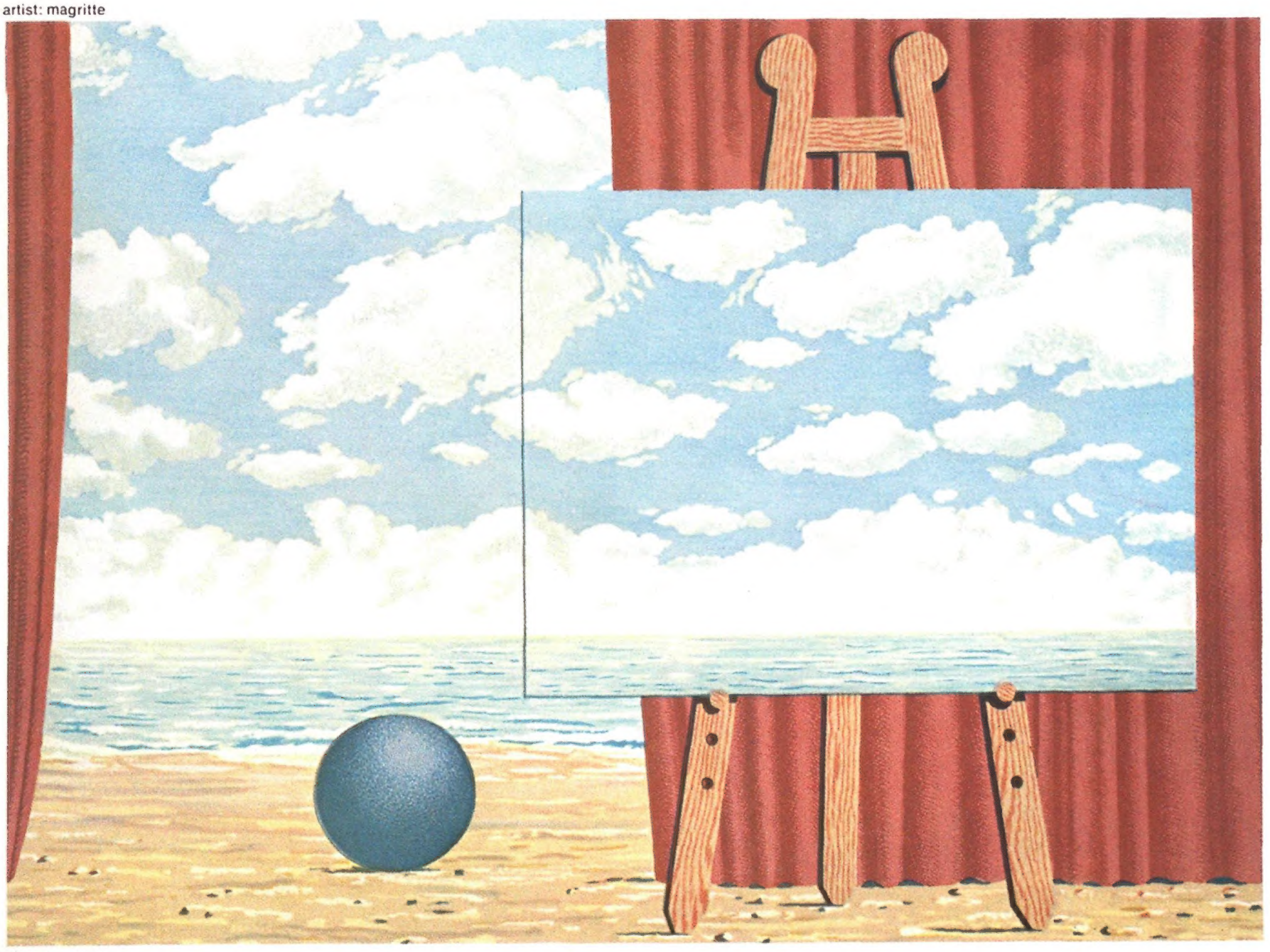
**The ideal**

Man will forever, for everyone, strip away the smothering blanket that separates him from the blue skies.

The cities suffer first. But air pollutants don't stop at city limits. They're blown to the four corners of the earth and the quality of air everywhere is degraded. Air pollution is everyone's problem. All of us must work at the solution. Governments, corporate management, educational institutions, research centers and individuals must combine forces to clear and protect the air. All of us together must make blue sky thinking an urgent new reality, or live—perhaps briefly—to regret our complacency.

**AtlanticRichfieldCompany**

artist: magritte



# This Superb Silver Medal

**Yours for just $1.00**

**To introduce a new kind of investment in art and in precious metals.**

**OVER 3 ½ TIMES MORE SILVER THAN IN A NEW UNITED STATES SILVER DOLLAR**
Shown larger than 40mm actual size (to show detail).

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Yes, you may have this incredibly beautiful Art Medallion in either 24 Karat Gold-Plated Sterling Silver, or Solid Sterling Silver for just $1.00...less than the cost of the precious metal alone. Why?

**We introduce you to a most spectacular opportunity.**

36 exquisite medallions depicting American Wildlife can be yours in this extraordinary and historic series. Each medal has been sculptured by one of America's leading artists and forged into rich, high relief medallions. Magnificent, lasting tributes to our rich heritage.

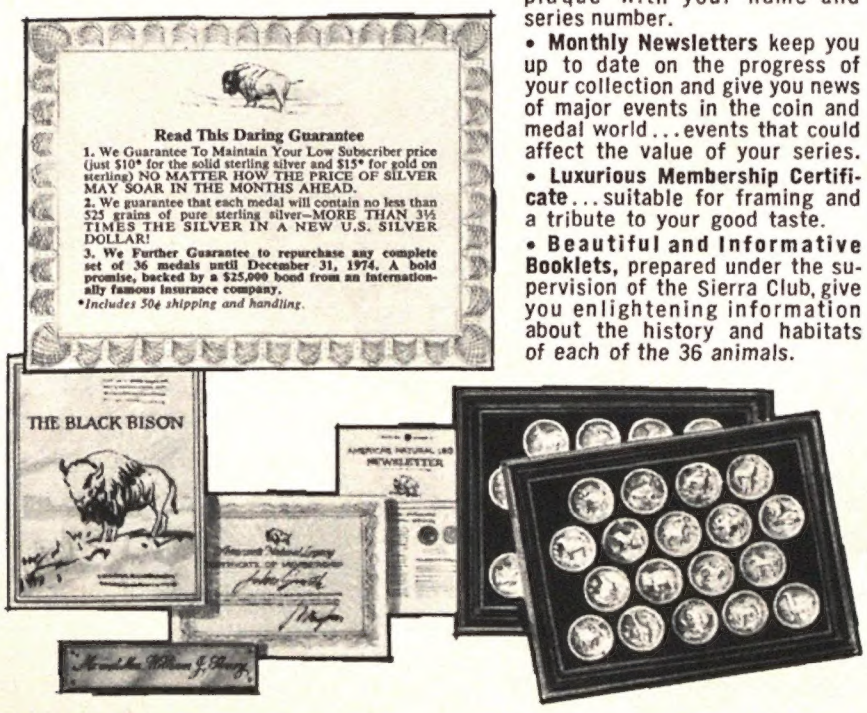
Imagine what a set of this magnitude can mean to you and your family. What unforgettable lessons in our natural heritage can be learned and shared. Imagine also, the possible financial growth that lies in this rare combination of fine sculpting and precious metals...forged into exquisite medallions to the uncompromising standards of the world famous and highly honored Wittnauer Jewelers.

To further enhance their value, every coin in your series will bear your individual and personal serial number—engraved on its edge, alongside the Hallmark.

**Daring Repurchase Guarantee**

The Longines Symphonette Society considers this set so fine, and of such strong growth potential, that it promises to buy back any completed set, for the full purchase price, any time to December 31, 1974, if you are not satisfied either in its progress...or in any other way. Moreover, this repurchase guarantee is backed by a $25,000 bond from an internationally famous insurance company.

## ALSO RECEIVE COMPLETE INVESTOR'S KIT—FREE


Read This Daring Guarantee
1. We Guarantee To Maintain Your Low Subscriber price (just $10* for the solid sterling silver and $15* for gold on sterling) NO MATTER HOW THE PRICE OF SILVER MAY SOAR IN THE MONTHS AHEAD.
2. We guarantee that each medal will contain no less than 525 grains of pure sterling silver—MORE THAN 3½ TIMES THE SILVER IN A NEW U.S. SILVER DOLLAR!
3. We Further Guarantee to repurchase any complete set of 36 medals until December 31, 1974. A bold promise, backed by a $25,000 bond from an internationally famous insurance company.
*Includes 50¢ shipping and handling.
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NEWSLETTER

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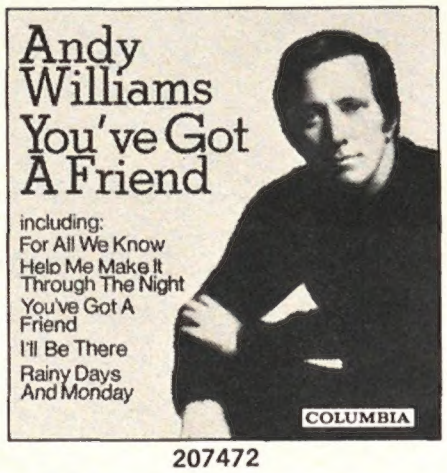


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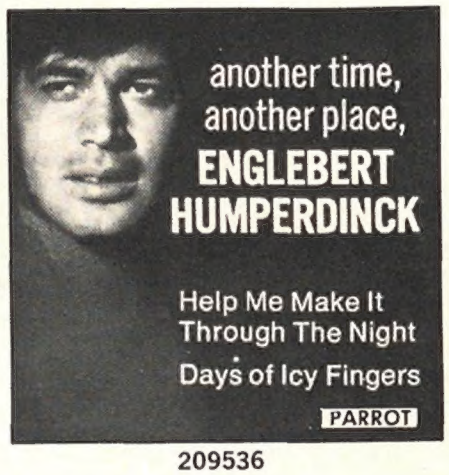


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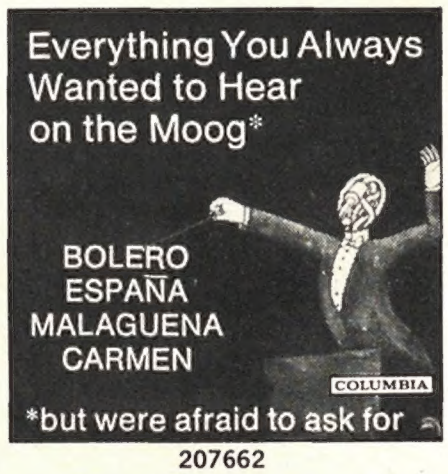


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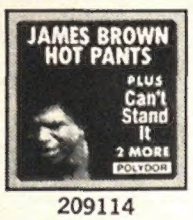


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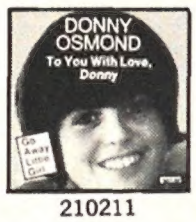


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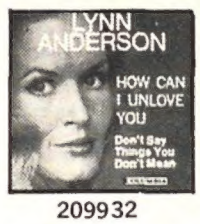


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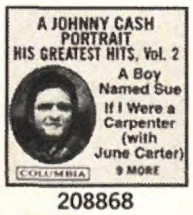


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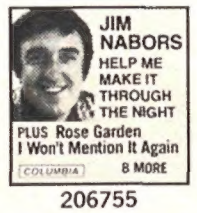


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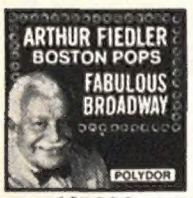


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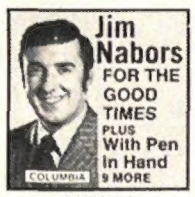


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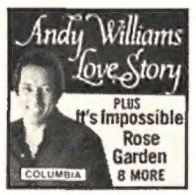


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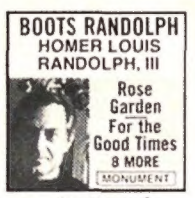


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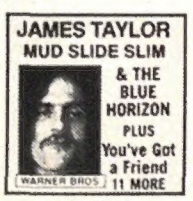


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209726

210252

196725

210161

*** Selections marked with a star are not available in reel tapes**

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# tapes for only $2.86

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**if you join now and agree to buy seven selections (at regular Club prices) during the coming year**

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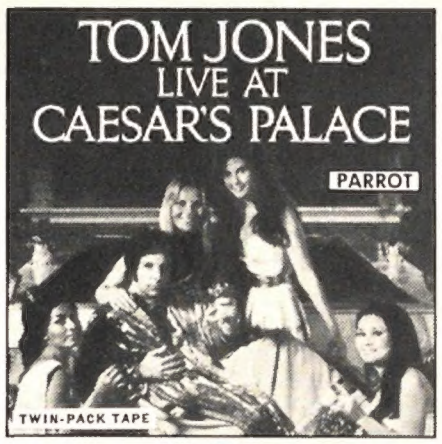


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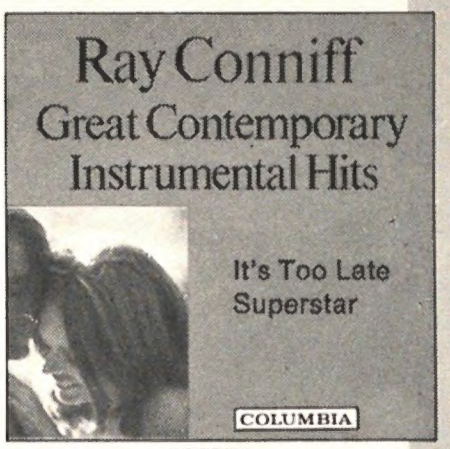


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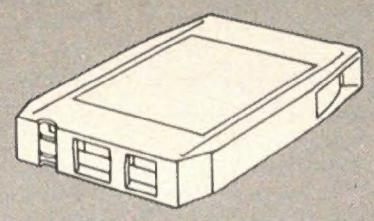
**Take your pick**



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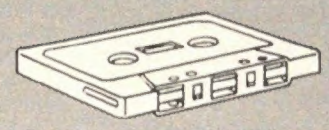
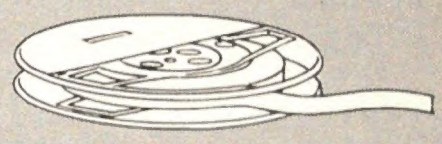
**OR**



**tape cassettes**

**OR**



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a service of
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Terre Haute, Indiana 47808

A129/S72

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Please accept my membership application in the Club. I am interested in this type of tape: **(check one only)**

**Be sure to check one box only**

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- ☐ **Tape Cassettes** (PH-X)
- ☐ **Reel-to-Reel Tapes** (ME-Y)

**AU6**

Send me the eight selections indicated at the right, for which I will be billed only $2.86, plus processing and postage. I agree to buy seven selections (at regular Club prices) during the coming year, and may cancel membership any time thereafter. If I continue, I will be eligible for your bonus plan. All selections will be described in advance in the Club magazine, sent every four weeks. If I do not want any selection, I'll return the selection card by the date specified — or use it to order any selection I do want. If I want *only* the regular selection, I need do nothing — it will be sent automatically. From time to time, I'll be offered special selections which I may accept or reject by using the dated form.

**Send these 8 selections for only $2.86**

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☐ Mr.
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City.....State.....Zip.....

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*January 1972*

# Smithsonian

Volume 2, Number 10

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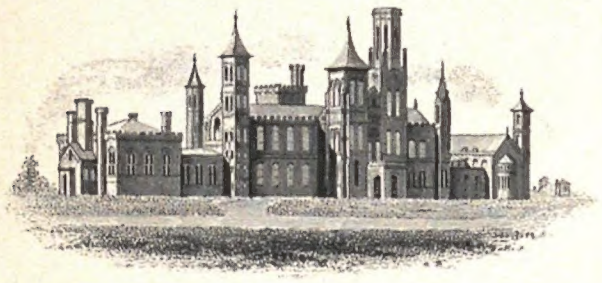
*Secretary Ripley's comments*

# *The view from the castle*



*Rich in its collections in the art of design,*
*Cooper-Hewitt Museum will prove*
*a vital part of our Institution in New York*

One of the least-known activities of the Institution is its newest museum in New York City. The Cooper-Hewitt Museum of Decorative Arts and Design will open its doors to the public, hopefully in early 1973. Only scholars at present may study its collections. When it opens, the Cooper-Hewitt will present major exhibits of prints and drawings, textiles, furniture and the decorative arts. The scope of the original collections is also being expanded to include urban planning, architecture and industrial design.

The name Cooper goes back to Peter Cooper, builder of the first steam locomotive in the young United States—the "Tom Thumb" of the Baltimore and Ohio Railroad. Its model is displayed in the Smithsonian Museum of History and Technology. Cooper became a philanthropist and founded the Cooper Union for the Advancement of Science and Art. This was where Lincoln gave a key political speech in 1860 ("Let us have faith that right makes might; and in that faith . . . dare to do our duty as we understand it"). Cooper's granddaughters, the Misses Sarah, Eleanor and Amy Hewitt, in effect founded the Union's collections and contributed important books to the library.

A lifelong friend of the Hewitt ladies was Henry F. du Pont, founder of the great Winterthur Museum in Delaware. He organized an informal committee to keep the collections together and to raise funds for the purpose. His efforts provided the genesis of the museum's transfer.

My own search for a new home for the museum was aided by Thomas Hoving, then New York City parks commissioner, later director of the Metropolitan Museum of Art, the late Stephen Currier, an old friend, and Geoffrey Platt, then Chairman of the City's Landmarks Preservation Commission. We finally focused on the magnificent old Andrew Carnegie mansion and its adjacent town house and surrounding park at Fifth Avenue between 90th and 91st Streets, owned by the Carnegie Corporation. After several years of friendly discussion, the Carnegie authorities have given this property to the Smithsonian to house this first national museum of design.

The re-creation in this wonderful house of such a museum and research center will add greatly to the present complex of museums and institutes which stretch along Fifth Avenue in stately panorama: America's "museum mile." With the new excitement provided by cultural forces stirring in the area, no single center for study and research in the decorative arts and design could be better located.

Eventually, with funds to be raised, the Smithsonian's museum of design will take its appropriate place in that complex, and add its quota to resources for research and education. The Smithsonian Board of Regents looks for local support to insure its maintenance in the future.

Under the direction of Mrs. Lisa Taylor and with an advisory board of New Yorkers especially interested in decorative arts, the Institution feels confident that with our dedicated staff and these superb collections, this Museum will become one of the stellar attractions of New York.

S. Dillon Ripley

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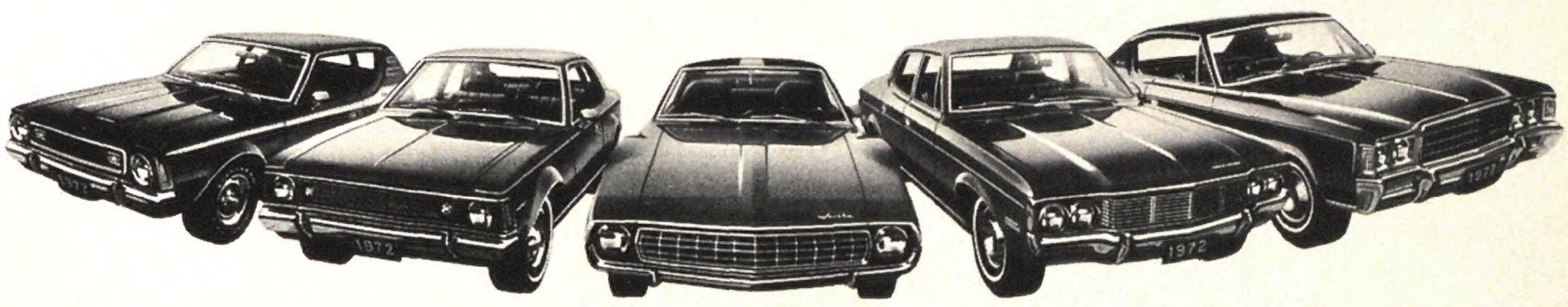

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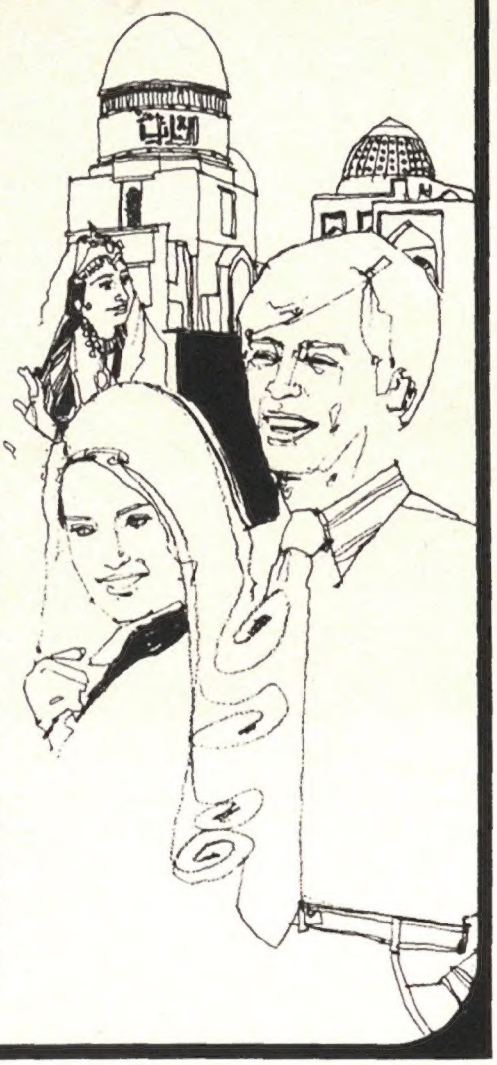

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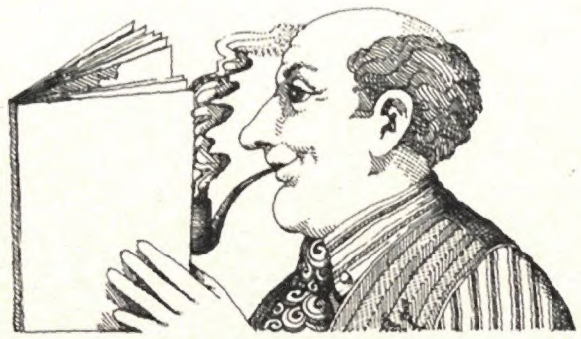

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# *Letters to the Editor*

## *Bird paradise*

Dear Sir: Two recent articles made a vivid impression on me: One, SMITHSONIAN's November article by Betty Werther, "For rare birds a paradise is found in France," with its cover picture of "a peacock in full display." The other, "The Shah's Princely Party" (*Life* magazine, October 29) which reported: "The main course was roast peacock served in its own brilliant plumage."

What a pity these articles could not have been published together to contrast the magnificent intelligence of the French naturalist Jean Delacour with the monumental insensitivity of the Shah of Iran.

True protocol would prohibit any of the Shah's guests, whatever their plumage, from mingling with the lowest of Dr. Delacour's permanent and migratory guests—so probably the "Princely Party" was their only out.

*A. Edward Ward*
Lowell, Michigan

## *Solar energy*

Dear Sir: Your article, "How to harness sunpower . . ." by Wilson Clark, reminded me of my own interest, before World War II, in two possible sources of meeting our future power needs.

At the same time that friends of mine who later went to work on the Manhattan project were promoting atomic power, I was aware that much experimental work in the use of solar energy was going on in Florida.

When the war came, all news of the atom was suppressed. But when the bomb exploded, interest in atomic energy ex-

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11. **An observer explains why the Soviet worker is more concerned with materialism than with civil rights.** (The New Leader)
12. **What happened every Saturday night at Rue de Fleurus . . . the home of Gertrude Stein.** (Art In America)
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# Whatever became of what's-his-face?

The impressive doors yawn wide. A young man still in his twenties, bright and enthusiastic, resumé in hand, walks in. The doors close, and swallowed within the corporate yawn, he becomes quietly anonymous.

Multiply the scene by the thousands each year. Engrave a company, or governmental, or educational or institutional name on the doors. Cast the principal players as male or female, black or white, young or not-so-young; it doesn't seem to matter very much.

Because in a very short time they all begin to look and act anonymous anyway.

Sure, our young man was out to lick the world when he was hired, but that was before he knew he had to lick the organization first.

If the organization is rigid with inflexibilities and staffed with supervisors who know how to say no but not yes, he is likely to seek a more invigorating climate. Worse yet, he may just give up, keep his eyes open and mouth shut, and begin twenty years of payments on a little retirement cottage.

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When Harvey's promotion opens up a slot, we don't look for a replica of Harvey to plug in. (Because who, in all the world, is exactly like Harvey?)

**Corporate life can be beautiful.**

We start by defining the job objectives. Then we give the job, along with plenty of latitude in achieving those objectives, to the individual whose skills, experience, character, and *attitude* most impress us.

The way he sets about getting results, we have reasoned, ought to be no less his responsibility than the results themselves. Given enough freedom and flexibility, he may do a few great things that Harvey never thought of. Or reject a few unnecessary things that Harvey always did.

**It's not just good works, it's good business.**

We think there's nothing that motivates people quite as effectively as treating them as individuals whose ideas are important.

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ploded too, and we've spent billions on research in this field. News about solar heat has been almost as scarce as news about atomic energy during the war.

Now, Wilson Clark has exploded a bomb with his article in your November issue. If our society has any future at all, his summary of the work and possibilities in the field of solar energy may have as much significance as the first explosion of the atomic bomb.

*Angus Laird*
Tallahassee, Florida

Dear Sir: In 1948 Eleanor Raymond, a Boston architect, worked with Dr. Maria Telkes, who was then at MIT, on the design and construction of the Dover Sun House. The house was the only one of its kind in New England occupied by a family and heated exclusively by the sun.

I found it most interesting that you discussed the solar-pioneering work of Dr. Telkes and wish that you had included a mention of the Dover Sun House.

*Mary N. Dixon*
Flushing, New York

## *Lie detector*

Dear Sir: I wish Patrick Ryan had confined his column to extolling the virtue of that grand old American tradition, the well-told lie. Maybe the American Polygraph Association is hyper-sensitive, but we are just a little surfeited with insidious propaganda, and some not so insidious, protesting that the dignity of Man is at stake whenever a merchant tries to identify the thieves who are bankrupting him. Ryan fails to note the tellers of American tall tales did it for the sheer joy of it, not to conceal malefactions.

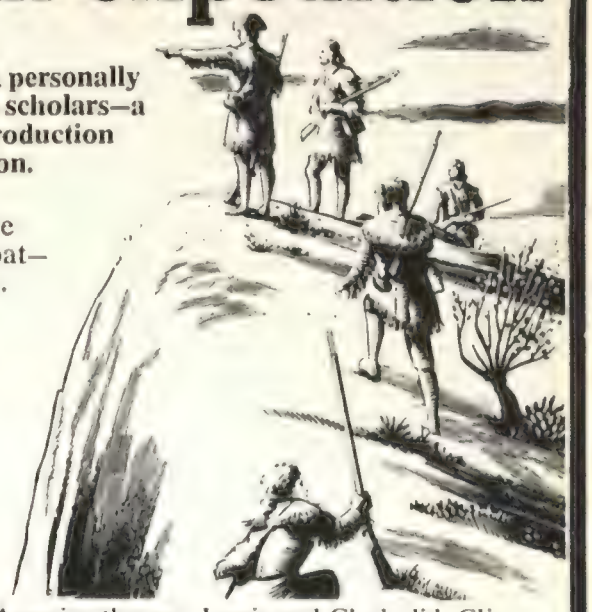
*Raymond J. Weir jr.,* President
American Polygraph Association
Washington, D.C.

*Until polygraph evidence is accepted as admission of guilt in the courts, it is wise to be wary.* Ed.

## *British "follies"*

Dear Sir: The British "follies" delightfully described in your tribute to English humor and originality have some lovely successors. Many countries participating in the 1968 Olympics in Mexico City contributed to the interest of the landscape by creating "jollies" of no utility except to amaze and amuse.


# Join the 1972
# Lewis & Clark expedition



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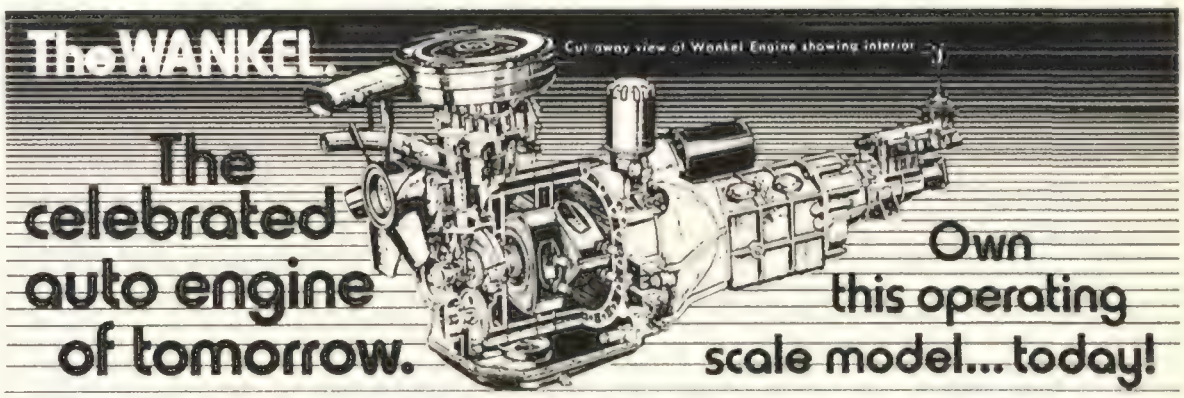


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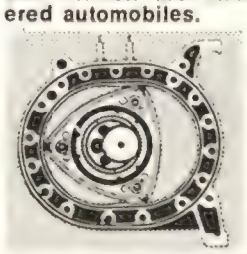

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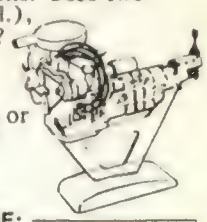

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Address_____

City_____ State_____ Zip_____

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Viva modern whimsy!

*Connie Latzko*
West New York, New Jersey

Israeli monument at Olympics

## *Monarch butterflies*

Dear Sir: Although I am aware that poems are not generally a part of SMITHSONIAN, I am submitting one on the development of the monarch butterfly. I, too, saw the metamorphosis take place as did young Mr. Battaglia.

*Oh creeping thing so close to earth*
*rise up on plant for your rebirth.*
*Feed on, feed on, your food from leaf*
*until conical egg hangs from beneath.*

*Like pendant jewel it hangs for days*
*and captures eyes to hold their gaze.*
*A chrysalis gem—so jade in color*
*with gold inlaid around its bower.*

*Vicissitude to blackened chrysalis—*
*in quietude a metamorphosis—*
*from simple thread of hope we know*
*a butterfly will soon elope and show.*

*Excitement stirs as life anew*
*within the conical is due.*
*It bursts its case to show its face—*
*a monarch butterfly with wings like lace.*

*(Florence Purvis, copyright 1971)*

*Mrs. W. Scott Purvis*
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The "young princes," also known as "the boxing boys," was reassembled from hundreds of fragments, then installed in the National Museum in Athens. There were no pieces found for portions that appear flat. Detail of the boy at left is on cover.

*Color photographs by Dmitri Kessel*

*By Robert Morse*

# The frescoes of Thera: spectacular finds in ancient Aegean rubble

*The first color photographs of frescoes just retrieved from a Minoan outpost buried about 1500 B.C. by a volcanic eruption*

The town of Akrotiri is not described in any guidebook and probably won't be for some years. It is 25 minutes by bus from Phira on the island called Thera in the Aegean Sea. But at Akrotiri, in an unspectacular and dusty ravine, some of the most dramatic archaeological finds of recent years have been made.

Intensive digging began in 1967 under the control of the Greek government. A small city, still only partially excavated and covering a few acres so far, has been uncovered. Among the hundreds of treasures found were the remarkable frescoes pictured here, in their first appearance in the United States. Several of the frescoes have been installed in their own private room at the National Museum in Athens—a remarkable feat in itself since all but one of the frescoes were discovered in many fragments, buried under the pumice and ash of a volcanic eruption that must have occurred about 1500 B.C.

That eruption was the climax of a time of seismic chaos in the Aegean that may well have been a major turning point in history. Scholars are increasingly convinced that the earthquakes and tidal waves that followed it destroyed not only the towns of Thera but also the great Minoan civilization on Crete, leveling all of the palaces there except the Palace of Knossos, and forcing most of the Minoans to flee. They spread to all points around the Mediterranean, especially to Greece, transplanting their art and religion and culture, and, according to one theory, adapting their script to the Greek language. Some scholars also suggest that the catastrophic destruction, which included the Thera volcano sinking into the sea, may have given rise to the ancient and enduring legend of Atlantis.

These days Thera is one of a handful of small islands (called Santorini on the maps) encircling the sunken crater. The big summer cruise ships stop there for at least a few hours. Passengers disembark by lighter, then climb aboard little donkeys for the dramatic, winding climb to the rim of the volcanic cliffs and the island's main village, Phira. In season, Phira is dedicated to extracting as many drachmas as possible in the short time most of the visitors stay. "We sale all touristique kinds," one shop boasts.

A few of the younger tourists strike off for the black volcanic-sand beaches. Serious travelers set off by bus, taxi or on foot to the island's archaeological sites and picturesque monasteries. Only a few reach Akrotiri.

There a cluster of tin-roofed buildings protects the newly found "city" from the elements; drab cement buildings house workrooms and quarters for the diggers. With a high fence around it, a forbidding gate which is only opened once an hour and on the hour, it has more the look of an army detention camp than the setting for high archaeological drama. Visitors are not encouraged, but those who do arrive during the digging season are courteously shown around by a young Greek guard—there are no guides, so people who speak no Greek must bring their imaginations to the maze of rooms, streets, tunnels and pots, some of which are still imbedded in the volcanic ash.

It will take the scholars years to determine conclusively the origins, the history and, most importantly, the significance of the finds at Akrotiri. And the ro-

*Robert Morse, a native of Oregon, was a veteran foreign correspondent for* Life *magazine and now lives on the island of Páros in Greece.*

The "Room of the Lilies"
is a main attraction at
Athens' National Museum.
This three-sided fresco
covers 140 square feet
and was discovered
mostly in one piece.
It is the largest complete
fresco of its period
yet to be found in Greece.

The left-hand wall of the "Room of the Lilies" (see previous page) has swallows among the lilies.

On right-hand wall, two swallows flirt joyously, perhaps signaling a wedding of the fertility gods.

mantic notion that this was the basis of the Atlantis legend may always remain just a notion. But it is worth noting that the elegantly refurbished old hotel in Phira, virtually destroyed by a 1956 earthquake, is now called "The Atlantis."

One of the main village streets was recently named "Marinatos." Professor Spyridon Marinatos, a distinguished professor of archaeology and now director general of antiquities in the Greek government, is in charge of the work at Akrotiri.

Professor Marinatos is an important man in the Greek bureaucracy; archaeology and the museums that go with it are part of the lifeblood of the country, tourism being Greece's greatest single source of foreign currency.

Despite running the vast bureaucracy of antiquities, the big and burly professor, amiable but by the nature of his profession wary of drawing conclusions and very protective of the results of his work, is most interested —almost obsessed, some say—about what is happening on Thera. It is, he admits, "the culmination of a dream of many, many years ago." In diggings on Crete in 1932 he discovered pumice stone not many miles from the Palace of Knossos and concluded that it could only have come from the eruptions on Thera.

In his writings he is very cautious about the possible connection between the Atlantis stories and the eruptions of Thera. In a little booklet, for example, entitled *Some Words About the Legend of Atlantis,* he points out that the word "legend," in modern Greek, "means something mixed of historic and imaginary elements and, above all, something which became a glorious but dubious tradition."

The professor is less reticent about his findings on Thera. "When I see these frescoes," he has said, "I can't believe my eyes that we have achieved such restoration. What we found last year was little more than painted dust." And he is full of anticipation for the things yet to come.

*Volcanic ash and an ancient well*

The selection of the Akrotiri site was not the result of a chance discovery by a local farmer, although numerous artifacts on Santorini have been uncovered by peasants in the fields. It was the result of long study. The first dig was undertaken by French archaeologists in 1870; another was conducted in 1899.

It was clear from the outset that these islands contained great archaeological riches, but there was a considerable problem: A white layer of volcanic ash covered most of the surface of the island to a depth of 100 to 165 feet. However, particularly in the 1899 digs, the archaeologists noted that in certain locations on the island, years of erosion by rainwater had gouged out some deep ravines, leaving them largely free of the deep-bedded ash.

On the basis of these old reports, the ravine near the present village of Akrotiri seemed a likely prospect for the serious dig Marinatos sought to conduct. A significant clue, which confirmed his choice, was found in the presence of a well about 65 feet from the sea. Today the well is only some 10 feet deep and provides very brackish water. But beside it stood two troughs, obviously designed to serve sheep, donkeys and other domestic animals.

"They were," Marinatos has noted in the first of his annual reports on the excavations, "clearly ancient and too heavy to have been transported from any distance. This was a first indication that we were in the neighborhood of some hidden ruin."

Miss Elizabeth Ralph of the University of Pennsylvania unsuccessfully tested the area for two days with a magnetometer. She realized at once, Marinatos reports, that the magnetic field of the lava was too strong to permit the instrument to note minor differences in the magnetic field of the soil. "There was no alternative," writes Marinatos, "but to use the classical methods of old-fashioned archaeology: trial trenches with pick and shovel."

The pick-and-shovel efforts began in 1967 and yielded sufficiently dramatic results to produce a great deal of elaborate speculation about the extent of the find (it was, some said, a city of 30,000) which irritated the judicious Marinatos.

Nevertheless the work—and the working crew—in-

The lilies *in situ*: workmen make cast of bed which, recreated, is now on display with fresco.

Nippled jug of a kind unique to Thera has beak of bird and was probably for fertility rites.

creased in 1968, when the first fresco fragments were uncovered. The dig at Akrotiri had become a major undertaking.

Detailed diagrams were drafted showing the layout of the myriad rooms and passageways. As the digging continued, hundreds of jugs, vases, pots and other artifacts accumulated; some areas of the site are still cluttered with them. A picture of the town at Akrotiri began to emerge. Most artifacts were of local origin, some were Mycenean. Yet a significant few were clearly imported from Minoan Crete. Indeed, it appears that Thera was a provincial outpost of Minoan civilization, lagging (as is common in such situations) about a generation behind the dominant Cretan style.

Then, between 1520 and 1500 B.C., an earthquake leveled the buildings on Thera. At least some of the inhabitants apparently had time to collect some valued possessions and flee.

Shortly afterward, a few people returned to Thera—"squatters" the archaeologists call them—perhaps to remove the dead, or to retrieve more of their possessions. They stayed only briefly: The island began to fall apart. The volcano started to erupt, filling up the ruins with pumice. After a series of eruptions, the volcano finally exploded and the island subsided many yards into the sea. Tons of white ash fell over the remaining islands, sealing up their ruins and their artifacts for over 3,000 years.

Of all the artifacts yet uncovered at Thera, the most exciting to the archaeologists are the frescoes. The first one, or rather part of one, to be found showed a dark-skinned face and a bit of a palm tree. It has been labeled "The African" but the museum carefully puts a (?) after the word "African." No one is quite sure why an "African" would have been there.

"The Monkeys" was the first of the large frescoes to be found, the initial piece revealing only the head of a blue monkey. In 1969 many more "monkey" fragments were discovered—a whole herd of monkeys climbing in all directions over the island's red rock. Professor Marinatos has pointed out, however, that the fragments were not found "under favorable conditions—many of the greater pieces of the fresco were found lying perpendicularly among sandy ashes and stones." Only a few months ago huge crates of carefully packed and sorted fragments arrived from Thera which, after probably many months of work, will be reassembled as "The Room of the Monkeys." This

Swallow on nippled jug above, most likely drawn from memory, is a combination of two species.

Elongated, probably sacred, vessel shows swallows arriving between clouds and waves.

fresco has convinced Marinatos that monkeys once existed on Thera, as they still do on Gibraltar.

Even before it has been reassembled, however, the scientists have been able to relate the monkey fresco in time to those found in the "House of Frescoes" just outside the Minoan Palace of Knossos in Crete. Here again was further evidence of the relationship between what had happened on Crete and the earthquake and eruptions on Thera.

"The elements are the same," Professor Marinatos has pointed out, "rocky landscapes, floral decorations, birds, a few animals and, as main subject, the life of the monkeys."

"It must be added," he wrote, "that stylistically both frescoes [the frescoes in Minoan Crete and the one in Thera] show exactly what would be expected: in Knossos the refined but a little effeminate and frozen and decorative tendencies of the Palatial artists; in Thera the painting is inferior in color quality and the style is more crude but more sincere."

Fresco fragments have always been a challenge to the restorers because the pieces found so often in the past have been worn at the edges. "That," one of the experts explains, "is the crucial factor. To keep them from rubbing against anything not only in the extracting but in the packing and transporting." But as Marinatos happily noted, "at Akrotiri the fragments were found for the most part abundant, not very badly worn and their extraction was made without the least loss or damage."

The only fresco now in the museum which was found basically intact was the three-sided "Room of the Lilies," as it has been called (pages 16 and 17). It covers an area of about 140 square feet, the largest nearly intact fresco of its period ever found in Greece. While it is reminiscent of some Minoan works, it shows —like the other frescoes and vases of Akrotiri—a character completely its own, indigenous to the island of Thera, though perhaps influenced by the art of Crete.

The lilies, of a red variety common in the Aegean, grow in clusters out of red, blue and green rocks. A particularly joyous feature of this spectacular fresco is the swallows that appear sometimes in pairs, sometimes singly among the lilies. Marinatos has rhapsodized, quite appropriately: "The swallows have arrived. They are flying about with joy, flirting with each other in the air. The wedding of the gods of fertility is taking place."

Spyridon Marinatos, Greece's director general of antiquities, is in charge of the dig at Thera.

Below, the hundreds of fragments of the antelope fresco (right) before reassembly in Athens.

While the transfer of the "Lilies" from Thera to the National Museum was a monumental achievement, assembling the jigsaw puzzles of the other frescoes is more astounding, though many parts are still missing. For example, two frescoes which most delight museum visitors (who pay the extra 35 cents to get into the special room which houses the Santorini collection) were discovered in tiny fragments flat in the volcanic dust, many of the pieces one on top of another.

One of them shows two gazelles or antelope (page 23) and the other, officially called the "Fresco of the Princes," is known more popularly as "the boxing boys" (cover and page 14).

It has been determined that the "young princes" and the two gazelles were originally on adjoining walls of the same room and that is how they have been re-created in the museum. Professor Marinatos thinks the two antelope were of the species *Oryx beisa* which still are found in East Africa. But, cautiously again, he has added that "this is a zoological enigma. Is this a traditional representation of an exotic animal or did antelope still live in the Aegean at that time?"

All the final reassembling of the frescoes was done at the Byzantine Museum in Athens, because, as one curator points out, "We are used to putting mosaics and paintings back together. The National is more accustomed to sculpture." Nine technicians, working under white-coated clinical conditions, worked on the frescoes for three months in the summer of 1970. Then some 30 technicians, some of them graduate students in archaeology, labored for another six months at the Byzantine Museum.

"There was," one of the technicians recalls, "a feeling of anticipation and excitement. Like a contest." They had to assemble 18 separate pieces to re-create simply the eye of the young prince on the left. One night the technicians had found enough fragments to establish that one of the princes was wearing an arm bracelet.

"Who," asked one of the workers, "was the god of the arts?" "Apollo, of course," was the reply. Whereupon there were several prayers to Apollo to "please send us more fragments."

Between the beneficence of Apollo and the cautious labors of Professor Marinatos, one can be sure that the technicians will receive more fragments from this ancient outpost of Minoan civilization. And romantics may even dream that somewhere, yet to be uncovered, lies evidence that Thera's Atlantis hotel has been aptly named.

Two antelope cavort under frieze. This fresco originally adjoined "the boxing boys" (page 14).

*By David P. Grimm*

# Antipollution show gets on the road

*Beloit collegians travel the Great Lakes region, battling teen-age apathy with a cram course in how to save the environment*

A scant mile from the western shore of Lake Michigan, where commercial fishing has all but died from industrial pollution and 25 years of infestation by sea lampreys, a bearded college student is allowed six minutes to answer questions about the reason why. They come from high school students two or three years his junior. Simultaneously, in a rural area of southeastern Wisconsin, a square-set college woman from Rhode Island tries to tell a half-dozen heckling high school football players what has happened to one of the state's most popular recreational waterways. Eventually she manages to outshout them.

These ecological evangelists came from the innovative Beloit College, Wisconsin. From September until Christmas vacation ten of them, teamed in pairs, traveled around the Great Lakes states in five 20-foot Winnebago campers, giving 30-minute slide talks and offering field trips to high schoolers free of charge wherever they could get an assembly period in which to do their thing. A reporter and photographer followed two of the teams—one of boys, one of girls—of this mobile project called EnvironVan. We heard the talks. We saw the planned field trips, in many cases, fail to interest teen-agers.

The program typifies the Beloit plan, an academic innovation which allows a student to spend a term doing anything constructive that he can dream up—and sell to his faculty advisor. In 1970, the school began a program to "get environmental education out of its ivory tower and out into the community where it's really needed," says Dr. Tom Renfrow, the math professor who directs EnvironVan. This year, foundations and other sources provided $10,250 along with a sweetening from the U.S. Department of Health, Education and Welfare.

Most of the money went to pay the ten EnvironVan participants $300 each for a summer of mapping out their presentation. They got another $1,200 each for their actual tour, out of which they had to pay their

Parkview School of Orfordville, Wisconsin, hears Beloit College's word on problems of pollution.

EnvironVan's boys' team gets some takers on an early field trip to test a Carney, Michigan, stream.

living expenses. So it's no junket. It's a learning experience from both sides of the lectern—especially when the camper's battery-driven heater chucks it all in at three A.M. while parked on Lake Superior's shore with a 40-mile wind whipping waves into an icy shroud. But the real heartbreakers were those neglected field trips —designed to be the best part of the show. Sometimes school administrators wouldn't meet the cost of dispatching a bus. "We'd take the kids in the camper," said Marilyn Browning of the girls' team, "but there's so little room."

Marilyn and her teammate, Darleen Masiak, chose the Rock River basin and its ecological woes as their project. They followed the stream from its source in the Horicon Marsh in east-central Wisconsin to where it empties into the Mississippi near Rock Island, Illinois. In a talk to 800 students of grades seven through 12 at Parkview School in Orfordville, Wisconsin, the most positive response came from the lower grades. "It's that way all over—really beautiful—the way these little kids question us," Darleen said.

Yet the college decided to stick with groups which were about 90 percent high school age. Despite the mores which govern these teen-agers, sometimes pushing them into an openly hostile response, the ones who *do* respond favorably are far closer to college or a job than the younger students. EnvironVan members agree that this is what the environment needs—qualified, enthusiastic people to take up the cudgel as soon as possible.

As a lecturer, Darleen is precise, almost letter-perfect. Several teachers took notes while she spoke. Marilyn talks like a city relative who has come back to the farm to tell the folks what she's learned. She makes it plain she likes being home. In a mainly rural school like Brodhead (Wisconsin) High School, where only 20 percent of the students go on to college, the "chewin' tobacco" approach seems to work. There was a complaint about not enough slides—the girls used about 50.

Meanwhile the boys' team, Don Meagher and Joe Strapko, visited Menominee High School, a $5 million

*Copy editor and feature writer on the Rockford, Illinois,* Morning Star, *David Grimm lives across the Wisconsin border in Williams Bay.*

Parked at Menominee (Michigan) High School, boys' team camper awaits early arrivals.

Don Meagher prepares his facts in the camper while his partner, Joe Strapko, drives.

open-campus learning center at the southernmost tip of Michigan's Upper Peninsula. Here they butted up against the third oldest interstate high school football rivalry in the nation, but managed to draw about 250 of the school's 600 science students to their lecture—voluntarily. The head of the science department, who touts the decline of Lake Michigan as one of the big area problems of future years, called the turnout "unbelievable."

So the bearded Meagher told the students about Lake Michigan being like a supersink, where the water is changed about once every hundred years—nowhere near the flow rate required to keep up with the pollutants being dumped into it daily by industry and sewage treatment plants. It's simple stuff, backed up by 15 or 20 slides and a talk by Joe Strapko, whose admittedly crude stick figures bring a touch of homey reality to his explanation of the nutrient cycle and the problems of sewage disposal. A few students, a few teachers stopped to talk further after the lecture and six-minute question-and-answer period. Just a few.

The boys' team was careful to promote the next day's field trip which they'd mapped out beforehand. It was scheduled for 10 A.M. in a state park a dozen miles northeast of Menominee on Lake Michigan's shore. Here students could get the greatest possible amount of information on specific local pollution.

The camper arrived on the scene 45 minutes early, its heater working overtime to warm the inside against a bitter 30-mile wind. Don and Joe, bundled in military surplus foul-weather clothing, were prepared to take samples of water from the mouth of a river which

Carney high schoolers watch Don Meagher run a water test to check pollution of local stream.

Girls' team, Darleen Masiak and Marilyn Browning, talk to Janesville, Wisconsin, treatment plant operator.

"T.R." with an antipollution message glares from above camper dashboard—where plants grow in cans.

could be reached by walking about three miles along a pine-enclosed trail.

Ten o'clock came and went. Ten-thirty. Eleven. Finally the two collegians left without the high schoolers. They were willing to tell their story to anyone willing to listen—including a reporter and photographer. Though the cold kept them from reaching the river's mouth, they spent a lot of time on the lake shore, explaining the way the sand is shifting—sometimes north, sometimes south, depending on wind.

Back in the prairies of south central Wisconsin, the girls' team, Marilyn and Darleen, got the same reception for a planned field trip to the Rock River power plant of Wisconsin Power and Light Company, just north of EnvironVan's mission control center, Beloit. The girls had designed their trip not to decry the air pollution being charged against power companies, but to point out the advanced equipment being installed to take smoke out of the atmosphere. They'd given an intensive sales pitch for their field trip. But when it came off, it again played only to a photographer and reporter. And a trip to the city of Janesville's multimillion dollar water-pollution control center at the city's southwest edge produced the same number of student takers—zero. Apparently, nobody in the "aware generation" wants to visit a sewage-treatment plant on a Saturday morning.

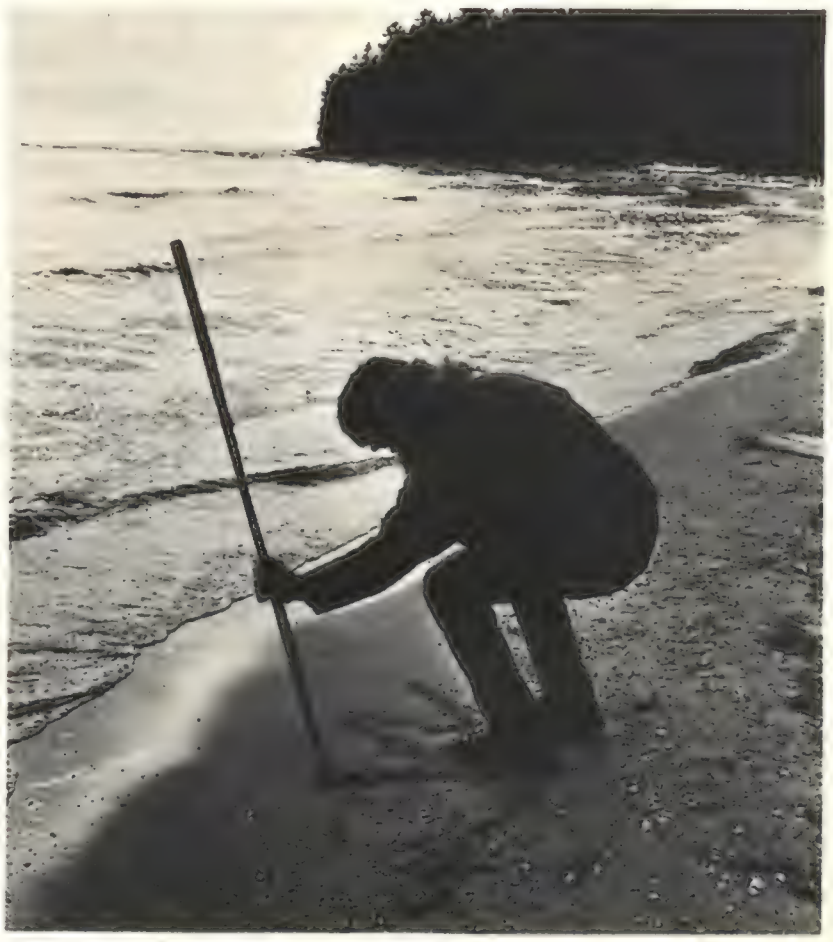
Still, both the college teams that took part and the school authorities behind EnvironVan consider the project one of the most successful ever undertaken by Beloit. Although high school youngsters aren't too big on giving up football weekends, the EnvironVan concepts are getting through to them. The reporter and photographer listened to Menominee High School students "rapping" about the boys' team, Meagher and Strapko.

"Their concepts gave me a new meaning," one student said. "There isn't much that's really new about what they're telling us, but I guess it's the fact that *they* are telling us that's important."

A girl gave a reason for the apparent lack of interest: "If environmental problems had been explained to us this way in grade school, more of us would have been interested by the time we got to high school." Another student said of local pollution, "It's here, but it won't be noticed until it's as bad as Lake Erie."

All agreed that they had learned something about pollution in their area and that essentially the project's concepts are sound. But they weren't prepared to believe that more action from school administrators would necessarily follow. "Sure, more assemblies like this are needed," one student said, "but today is as far as it's going to go." At least this attitude indicates a certain student discomfort about the environment. And the team members all feel that their primary mission is to implant such a sense of discomfort about the world's decay.

"Older teachers talk about rivers and ponds that they once could drink from," said one high school girl. "Well, I wasn't around until recently. Did I do that much to pollute them?" That sort of awareness suggests that EnvironVan's message got through or will.



Joe Strapko traces with a stick the movement of beach sands due to waves on Lake Michigan.

Boys' team's successful field trip in Carney demonstrated procedures for testing a stream.

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This self-assured territorial bull, alpha male in the study area, has horns more than four feet long.

*By Richard D. Estes*

# The most splendid antelope is also one of the least safe

*The scimitar-horned and presently endangered giant sable leads a territorial and, till now, little-known life in Angola's dense woodland*

A black bull joined the herd near midnight. Immense in the moonlight, he towered head and shoulders above the cows and immature males, his scimitar horns nearly twice as long as theirs. Now and again moonbeams reflected from his eyes, and they flashed green like huge fireflies, completing the illusion that a demon had materialized from the wraiths of ground fog rising out of the low meadow. This was one of the most impressive sights I recall in five years spent observing African wildlife.

It happened in the Luando Reserve of central Angola, 3,700 square miles of savanna woodland and floodplain grassland that is the home of the giant sable, the most splendid of all antelope. The giant sable which weighs in the neighborhood of 500 pounds and stands up to 52 inches at the shoulder, is also among the rarest of antelope. Sparsely distributed at best and largely restricted to this small region, where it is forced to compete with man, it is listed as an endangered subspecies in the *Red Data Book* of the International Union for Conservation of Nature and Natural Resources. Sponsored by this organization and supported by the National Geographic Society and the Conservation Foundation, my wife and I went to the Luando Reserve in September 1969, to follow the giant sable through a full annual cycle. We wished to compare its food habits, habitat preferences, population dynamics and behavior with other populations we had studied during the previous year, as well as determine its current status and make recommendations for conserving it.

*An associate in mammalogy at Harvard's Museum of Comparative Zoology and a veteran observer of African wildlife, Mr. Estes recently completed the first intensive study of the giant sable.*

### *Star attraction of the woodland*

With horns averaging a foot longer than other subspecies (*the record is 64⅞ inches*), the giant sable is the only thing to distinguish this part of Africa as an area of special faunal interest. Its habitat, however well-watered and apparently lush, never seems to support either great numbers or variety of big game, and consequently few predators. This is true not only in Angola, but in Zambia and southern Tanzania—in fact, throughout the monotonous Brachystegia woodland zone (miombo) that belts the continent between East and South Africa. The fauna of Africa's plains and even the deserts is far richer.

In the Luando Reserve, the only mammals we regularly encountered were warthog, bush duiker, sable reedbuck and roan, in approximately that order. While the larger predators are all represented, only the side-striped jackal could be considered common; we never saw or heard a lion, and the only fresh set of tracks was seen, improbably enough, 100 yards from our house. Clearly the giant sable is the star attraction.

Just how rare the giant sable is remains to be seen. An accurate count would entail an aerial census by helicopter in July or early August, when the trees lose their leaves after the annual fires, and the sable venture out onto the open meadows to feed early and late in the day. The most that can be said is that probably more than 1,000 but less than 2,000 live in the Luando Reserve. Another 100-plus inhabit the 200 square-mile Cangandala Reserve near Malanje, recently proclaimed a national park. Some sable also survive in the country between, and adjacent to, the two reserves, but there cannot be many. In the almost roadless woodland of the Luando Reserve, sable herds are hard to locate. We saw only 17 different herds totaling 299 head during our 12 months in the area.

By good fortune there proved to be a relatively accessible and approachable herd within ten miles of Quimbango, a tiny village in the heart of the Luando Reserve. Thanks to the assistance of the ranger and his four African scouts, we managed to keep track of these animals almost day by day during the rainy season (October to April) and the following dry season. From observations of this herd and others, a behavioral and ecological profile of the species emerged.

Like all herbivores, the sable spends most of its time just feeding and digesting. Grasses make up the bulk

Over-the-shoulder stab could be lethal, but these juvenile males are only sparring.

Long-yearlings (about two years old) confront one another in a mock battle.

of its diet, but as much as a third consists of herbs and the leaves of woody plants at certain times.

The quest for preferred food plants, we found, largely determines a herd's habitat preferences and day-to-day movements. For the sable, the woods and meadows are a vast garden producing an ever-changing variety of foodstuffs, and he is a gourmet in quest of the choicest offerings. For most of the year the supply greatly exceeds the demand, and the sable has to move very little to satisfy its needs. It was common to find our herd day after day within a few hundred yards of where we had left it the evening before. But every week or less, the herd would suddenly move a mile or two and settle in a new location. It also made trips, usually daily, to water—preferably a muddy pool rather than a flowing stream—and periodically visited natural salt licks.

In the rainy months, giant sable frequent the woodland, where the ground remains firm, the grass stays short and the tender-leafed, tufted perennials they prefer are to be found. The meadows, being lower and poorly drained, soon become waterlogged and consequently support only a sparse cover of wiry, unpalatable grasses and sedges. Actually, the best growing conditions occur just inside the tree line, and the sable accordingly feeds mainly on the woodland edge.

In the dry season the pattern is completely reversed. The woodland vegetation is the first to turn sere. As the water table drops, a crop of late-flowering perennial grasses springs up in the meadows, drawing the sable into the open. But these grasses quickly become tall and coarse, and the drying-out process accelerates as the sun beats down, the humidity drops and the dry-season winds gather strength. The quest for green herbage now forces the sable to move greater distances, to the remaining wet spots around springs and swamps.

Finally the time comes when the effort exceeds the benefits and at that point the sable begins taking standing hay—or would except for man's intervention. Within two months after the rains end, much of the vegetation is dry enough to burn, and the Songo, the main tribe living in the reserve, waste no time in firing it. Fire becomes a daily event for as long as there is anything left to burn; soon the atmosphere becomes so full of smoke and dust that by four in the afternoon you can look straight into the sun.

Burning is a universal and ancient practice among primitive peoples. Since matches have become easily available, burning has gotten out of hand—literally—resulting in the impoverishment of the environment when soil organic matter and fire-tender species are destroyed through too-frequent fires.

In many cases, nevertheless, herbivores may be almost totally dependent on burning for green herbage during the dry season. This is certainly true of the giant sable and all the other grazers of the region. Wherever the soil retains enough moisture, fire stimulates a new growth of grasses and herbs. The woodland soils are usually too arid to flush and remain blackened and bare until the early rains of September.

No fooling: A belligerent, high-ranking cow pursues a lower-ranking one through the woods.

Because of differences in soil moisture, some places burn sooner than others, resulting in a mosaic of pastures at different stages of regrowth; this enables the sable to continue to pick and choose. Many herbs and small shrubs also choose this time to flower, after the overshadowing grasses have been removed. Some meadows become multihued tapestries of sprouting and blooming dwarf shrubs, and the sable banquets on the new shoots.

A little later, the trees too begin to put forth new foliage and spring comes to the woods a good month before the rains begin. Coming as it does at the very time when the heat, the dryness and the dust are most oppressive, when the ceaseless din of cicadas and locusts makes the air vibrate, this renascence seems almost miraculous. In the beginning the new leaves are every possible hue but green: wine, coppery red and all shades of orange. Later on they change to the freshest shades of green.

At this season, our sable herd was still feeding mainly on the meadows, but now withdrew to the woods earlier in the morning than before, partly for the coolness, partly to browse on the new foliage and partly to escape the *moscardos*—horseflies of several species that appear in great numbers at this season to plague man and beast. Tsetse flies are a year-round nuisance—but these bothered the sable far less than they bothered us.

Soon after the rains finally break in the form of highly localized and often violent downpours, the green mantle once again becomes universal. The sable returns to the woodland pastures and so the annual cycle is completed. The natural rotation of grazing grounds is as efficient as modern man, using fenced paddocks, could devise for his livestock, and because of the sable's low distribution rate, the problem of overgrazing would never arise.

Every sable herd is a community, with its own traditional home range. In the process of growing up in the herd, each new crop of calves gains an intimate knowledge of the best pastures, favorite waterholes and salt licks. Thus a herd has traditions which can be passed on through succeeding generations in a manner roughly comparable to that of primitive human societies. Sable have been known to frequent exactly the same areas for decades while adjacent areas, to all appearances equally suitable, have never been used. Under stable conditions, a herd probably occupies a particular home range indefinitely, in unbroken succession of generations. If so, the herd may be fairly compared to a human clan.

After spending long hours with our animals, we became aware of a quality of stability and security that exists within a herd. When the full group of 28 was bedded down late in the morning, quietly ruminating and resting, the feeling of peace and safety was particularly strong. This is really the essence of the herd, and indeed of sociability itself. The difference between a sable in a group and on its own is striking: The lone animal seems far more alert, frequently interrupting

its feeding or resting to look, listen and sniff the air.

Herd animals rarely look up, except in response to some real stimulus. Their awareness is focused inward as much as outward, for there is continual interaction among them. All are ranked in a hierarchy based on age, with the oldest cows at the top, two-year olds and yearlings at the bottom. Most interactions involve ritualized displays of dominance and submission. In this manner the hierarchy is continually reinforced.

Relationships are freer and easier among the immature animals, who often play and spar. A potentially lethal fighting style is revealed in their mock fights: Kneeling side by side, they stab backward and downward. This is harmless enough while the horns are short. But in serious duels between adults their long needle-sharp horns could easily inflict deep penetration wounds. The practice of this particular technique, which begins with young hornless calves, virtually ceases before the animals are fully armed. Adult males generally go no further than a ritualized and quite safe head-on pushing from which the weaker animal quickly retires.

However, sable do defend themselves in this way against other species, and cases of lions and people being killed by wounded sable have given it a reputation as a formidable fighter.

Males turn black between three and four years. At around five a bull is fully mature, a *macho grande* fit to establish a territory. But until and unless he has his own place, he will have no opportunity—nor sufficient drive—to reproduce. This is the first imperative of a territorial system.

The great majority of antelope studied up to now have proved to be territorial. The usual pattern, in which each territorial male is king of his own castle, so to speak, is considerably modified in the sable. We found that a relatively few master or "alpha" bulls were dominant over wide areas in which other "satellite" bulls also held territories. Each alpha bull had his own core territory where he spent most of his time, often in company with a herd. But when the herd wandered outside the core area into a neighboring territory, he would frequently accompany it and proceed to dominate, if not drive away, temporarily, the nominal owner. Most but not all of the satellite bulls were perceptibly younger and of lighter build. Not that the master bulls looked old—only mature, and serene with a majestic self-confidence. In asserting dominance, of course, self-assurance is the *sine qua non,* more decisive than horn length or strength, though derived ultimately from the latter.

Of eight territorial males encountered in our study area (equal to approximately one bull per two square miles), only three appeared to be alphas; they showed great respect for one another's spheres of influence by almost never trespassing.

The sable bull is unusually autocratic and able to control a herd far more effectively than other antelope we have studied. In the wildebeest, for instance (SMITHSONIAN, August 1971), the bull cannot long hold a herd against its will—the animals simply dodge him and escape quickly into the next territory, where the first bull dare not follow. Sable territories are not only much larger, but females and young are also far more intimidated by their bulls. When a bull threatens, with neck arched like a stallion's and tail held stiffly out, all kowtow with lowered head and tail clamped like a cowering dog.

*Appeasing the patriarchs*

This submissive display appeases the bull's aggressiveness so effectively that young males are tolerated in the herd to the relatively advanced age of three. In most antelope, they are ejected as yearlings and thereafter live in bachelor herds until maturity. The sable's population density is often so low that bachelor herds would be very small or nonexistent; young males therefore have a better chance of surviving the longer they stay in the nursery herds.

Within a herd, bulls are often the most relaxed and approachable animals; but when alone they are surprisingly self-effacing, frequenting the densest woodland. Scrapes and fresh dung on the roads—territorial markings—are usually all that one sees of a *solitario.*

Courtship driving by the sable bull is more intensive than the usual antelope hazing/herding behavior, and it can be quite brutal. The "demon" bull who joined the herd on one moonlight vigil spent most of the night chasing cows, concentrating on a one-horned female in whom he was obviously sexually interested. Equally obviously, she wanted only to be left in peace,

A weak maternal bond: Calves associate mostly with each other, missing the mother only when hungry.

A satellite bull attempts to chase some female sable out of an alpha male's territory to his own.

and in fact only entered estrus two weeks later. But short of actually quitting the herd and the area completely—which no herd animal will do—there was no escape for her.

The ultimate display of submission in the sable is to lie down with the head stretched out on the ground. One-horn kept doing this, but each time the bull would prod her with a stiff foreleg—normally a courtship display given while following a female—until she got up and ran again, closely pursued. At times she screamed in fear and he gave a deep bellow. By moonlight the spectacle was eerie, almost frightening. As the rutting peaked we saw this hard driving more often. It only ended when a cow stopped running away; thereafter courtship proceeded at a walk until finally the day came when she would stand for mounting.

After a gestation period of approximately eight months, a cow produces a single calf, usually in May when the grass is at its highest but still too green to burn. The calves spend two or three weeks in concealment, during which the cows absent themselves from the herd, either singly, in pairs or small groups.

A whole set of behavioral adaptations makes concealment effective: The mother stays away from the hiding place and usually comes to feed the calf only after dark; the calf requires the active stimulation of licking before it can urinate or defecate (preventing smells that could attract a predator). Most important, the calf lies still when it is alone. Only once did we manage to find calves in the concealment stage, while the high grass made it impossible to keep expectant females under observation, much less witness a birth.

As soon as they join the herd, calves get together, and thereafter have far more contact with one another than with their mothers, whom they seem to miss only when hungry. Age groupings persist until the animals mature and are a conspicuous feature of the social organization of sable and of many other antelope. Apparently these associations compensate for the weak mother-infant bond inherent in this system, hastening the formation of social bonds with the herd.

Young calves rest, feed and play together, and when the herd moves they characteristically bring up the rear—a habit that would appear to increase the risk of predation by the occasional leopard or spotted hyena. But it is not predation that makes the giant sable's future appear clouded. Nor, in the two sanctuaries, is poaching a present danger, thanks to unusually heavy penalties for hunting sable, including a fine of more than $3,500.

The real danger is habitat destruction by the African population, which already numbers over 16,000 people in the Luando Reserve and is apparently growing rapidly. The Songo subsist chiefly on manioc, while rice is cultivated as a cash crop. Sable are frequently encountered in proximity to the villages and this is taken by some as evidence that clearing and cultivation may actually work to its benefit. But we found little evidence that sable frequent former cultivation sites—unsurprisingly, for after a maximum of three crops, the leached, ferritic soil common to miombo woodland is exhausted. Thirty to 40 years must then pass before it recovers sufficiently to be reworked.

### *A promising long-term solution*

It seems more likely that man and sable are actually vying for the most productive land, and that unless steps are taken to safeguard a sufficiently large area of habitat, the giant sable is headed for extinction. Our key recommendation is that, after making adequate provision for the needs of the present population, the rest of the area—possibly with the addition of surrounding wilderness where sable still survive—be permanently closed to all development.

A promising long-term solution, suggested by a retired senior government official, Intendente J. A. Silva, might be to persuade the Songo to cultivate rice as their staple food. The vast floodplains of the region are potentially some of the most productive rice lands in Africa. Not only would it benefit the Songo economically, but it would also relieve the pressure on the sable's habitat, since very few frequent the floodplains. Such an accommodation would permit both to coexist with a minimum amount of interference, and the sable's future could be assured for as long as effective protection can be maintained.

One calf grazes while the other (foreground) flinches when two oxpeckers land upon it.

Simulated television picture.

# The story of the

## (Or how to remember how real

The photograph above is a dramatization of something that actually happened.

We wanted to tell you how real we think the picture is on Sylvania color television.

Of course, GTE Sylvania engineers would be happy to do so. Likewise our dealers. And set owners too.

But they could be biased. Besides, we wanted to do it in a way you'd remember.

We did. In a dramatization that's on the air now.

It's a commercial (if you haven't seen it) that starts with a cat at an open window.

He's looking into a room in which a film of a canary

730 Third Ave., New York 10017

# cat and the canary.

## the picture can look on color television.)

is being shown on a Sylvania color set.

The cat stands there watching the film... his head moving with the movement of the picture on the screen.

Silently he drops to the floor. Slowly, as if stalking his prey, he starts toward the set.

As the cat nears the set he stops. Snarls. And then ...springs.

We hope you'll remember this little dramatization when you're shopping for a color television set.

Especially if you want a really real-looking picture.

GTE SYLVANIA

a part of General Telephone & Electronics

In a round of *City Model,* decisions made here
are fed to a computer. It's cheaper than renting a city.

*By Paul Dixon*

# Playing games with reality

*Do you want to plan a city? Run a hotel? Start or end a war? Even if you want to raise chickens, there is a way to play*

Error-mongers. Incompetent do-gooders. Professional blunderers. These were some of the nicer names used for the mayor and his city council. The situation in the city was bad and getting worse. Many of the problems could be laid to the administration which two years earlier had been swept into office on a platform of civic reform and better urban planning.

The administration had vowed to bring the city out of the red financially, but had succeeded in increasing the city's debt and was forced to raise taxes. A very liberal welfare boost attracted hundreds of suburban poor to the inner city. An overly ambitious public housing program had run out of funds just after the old housing had been demolished. A recently enacted provision for free bus and rail transportation had been passed to help the inner-city poor but, as it worked out, was a boon chiefly to the well-heeled commuter. (Someone had forgotten to amend the bus routes to serve the inner city.)

In response to these and other snafus, a broad spectrum of citizens sent representatives to city hall to demand that the mayor resign. The administration persuaded the citizens that it now had learned enough by trial and error to lead the city out of its crisis.

These events took place during a round of *City Model,* a computerized game created by Envirometrics, a small, nonprofit, urban research firm in Washington, D.C. It is one of the more sophisticated of hundreds of new simulation games, so-called because they imitate some facet of reality and are used by thousands from the President on down. These "serious games" differ from *Scrabble* or baseball which imitate nothing and are unique unto themselves.

Probably the most well-known of this type of game is *Monopoly,* which simulates the economics of real-estate speculation at the beginning of the Depression. But, unlike *Monopoly,* the new simulation games are used for training, teaching and research. They are designed as tools for dealing with reality rather than escaping it.

Although up to 100 people can play *City Model* at once, 20 to 40 players normally play each game. Each player is first assigned a role—either that of an individual such as the mayor, or that of a group, such as a bloc of citizens.

The players are then presented with a city. The computer at the heart of *City Model* contains a repertoire of cities ranging in populations up to 1.5 million. The Envirometrics' staff describes the chosen city in terms of sizes, problems and neighborhoods and each player is given a packet of specific information on his or her role in the game.

Each half-day round represents a year in the life of the city. There is no set goal for the game and no one wins or loses in any specific sense. The goals are set by the players, not by Envirometrics, but most often players try to improve the lot of the city's inhabitants.

The players begin to make decisions they believe will advance their goals. The decisions are written down, coded and fed into the computer which reports on their effect on the city. Each player has a variety of options. The mayor, for example, can begin by reallocating funds in his budget while a citizen bloc can order boycotts and vote in periodic elections.

After the first round, the computer quickly works out the effect of all the first-round decisions, and prints out for each player a new packet of information showing him what happened in his realm as a consequence of his and other people's decisions.

Rounds of *City Model* are liable to be hectic and guaranteed to be complex. The players may improve or worsen conditions in the city, but, regardless of the outcome, players generally acknowledge that they have learned from the experience of *City Model.*

The president of Envirometrics, Dr. Peter House, sees two major uses for his firm's game. First, students from high school on up can learn urban dynamics in a unique manner. Second, says House, "the game is a laboratory in which researchers and urban planners can test their theories without having to try them on real people. It's cheaper than renting a city."

*Paul Dixon, whose article on the earth-resources satellite appeared a year ago in* SMITHSONIAN, *has just published his first book,* Think Tanks.

*City Model* represents one broad category of simulation games known as "machine" games, those that rely on computers. The other category is "manual" games, which are portable like *Monopoly*: It is these that are finding their way into the classroom. An example is *Dangerous Parallel,* produced by Abt Associates, a Cambridge, Massachusetts, research firm, under the sponsorship of the Foreign Policy Association: "Four months ago," says a recording played to brief the players, "the troops of Inland, probably encouraged by Transania, swept across the border . . . intending to occupy Outland within a few days. New Zenith responded by sending troops to the defense of Outland."

Teams of players, high school students, represent six fictional nations with world roles approximating those of the nations that figured in the Korean War.

*Social studies' concepts from Nordo*

Each team is given a packet of materials including histories of its nation, top secret lists of resources, catalogs of decisions possible for its nation during crises. For example, Nordo is a large and poor nation like India that wants the war brought to a quick close. Nordo would prefer economic aid from the two major powers backing the war rather than have them expend their resources on the Inland-Outland conflict.

In a typical round, the players representing Nordo grope for means to stop the war. First, Nordo's ministers deliver a strong plea to the International Council to resolve the conflict. Then, in order to maintain its neutrality, it refuses a needed four billion dollars offered by Transania (Mainland China) in exchange for military sanctions. Finally, Nordo attempts to act as a go-between, to work with the other nations in achieving a peaceful solution. As it works out, peace efforts fail during this round as casualties mount at the scene of conflict.

*Dangerous Parallel* drives home social studies' concepts in a novel manner. Students discover how an ambiguous public statement by one nation can foster worldwide confusion. They find how easily an ally can be lost, or that the behavior of a neutral nation can affect a war. In the game's compressed world, students must make decisions and then cope with the consequences of those decisions.

Between highly sophisticated computer games like *City Model* and manual games like *Dangerous Parallel,* there are hundreds of other simulation games played in a variety of fields for a number of tasks as diverse as training air-pollution control administrators and aiding high school students in unscrambling the vagaries of installment buying. New games are appearing so fast that nobody knows how many there are.

Employing games for purposes other than just to entertain is not new. The ancient Chinese game of encirclement, *Wei-Hai,* a tabletop exercise in strategy, is attributed to the military thinker Sun-Tzu. By the latter half of the last century in Prussia the war game had emerged as a sophisticated and trusted element in military planning. The U.S. Department of Defense has used gaming techniques extensively, ranging from simple role-playing games in which hypothetical crises are set up and acted out by players to ultrasophisticated computer-assisted games involving detailed battles and thermonuclear exchanges.

In the early 1960s a group of academic gamers led by Dr. James Coleman of Johns Hopkins University suggested that some of the motivation and interest shown on the athletic field might be transferable to the classroom and training situations through simulation games, and since then games of purpose have emerged in a variety of nonmilitary areas. By far the largest game audience in the nation today is in the classroom. At the primary and secondary school level most games are part of what is currently being termed the "new social studies," which can be broadly defined as a rejection of learning factual material by rote in favor of conceptual thinking along with facts.

In *Panic,* for example, students assume roles played by economic pressure groups during the Depression. In *Destination* junior high school students solve travel problems to learn geographical concepts.

*Another educational craze?*

More sophisticated games are finding substantial interest on the college campus. *City Model* is currently used to teach six different disciplines on as many campuses. Some games have very specific purposes, such as *The Cornell Hotel Administration Simulation,* or *The University of Massachusetts Poultry Farm Management Game.*

The claims for simulation games are enthusiastic: They are great teachers of realism, are intrinsically motivating and develop varied skills. They help slow students and also bright students. But, like teaching machines, games have prompted their share of skepticism, nowhere expressed more sarcastically than by the editor of *Media and Methods* in a 1970 issue of that journal: "Simulation games will revolutionize teaching (what won't?). Students will freak out on them (thus solving the drug problem), low tracks will suddenly become hypermotivated, teachers will become guides (referees, one supposes) and we will lockstep toward Nirvana with a pair of dice in hand."

Funded by the U.S. Office of Education, the Academic Games Program at Johns Hopkins University is attempting to determine the real education value of games. Dr. Steven J. Kidder, head of the program says:

"The list of questions that must be answered about games is a long one. For example, what kinds of games played under what conditions are more effective than traditional classroom methods? Even more fundamental is the still unanswered question of exactly what lessons are students learning from games? We and others believe that the real impact of games is felt in terms of changed attitudes, motivations and the social structure of the classroom; however, what is lacking is an understanding of how, why, to what extent and in what direction."

Not all of the new games are intended solely for training and learning. Some aim at research and new understanding of pressing problems while others show promise as policy-making tools—for example, a new computer offering from the Duke University Social System Simulation Program called *The Population Game*. Primarily a training game today, its future may well rest as a computer-assisted tool for family planning on a national level.

The general situation at the beginning of the game is like that which exists in some developing countries. One player is in charge of the entire national family planning program and he allots funds to players representing regional directors who, in turn, allocate funds to district directors, each in charge of areas of about one million people. Each player in the hierarchy must decide how best to spend the money given to him.

Edward Jacobson, a researcher working on *The Population Game,* points out that the model has built-in controls over the simplistic or quick result. "For example, at a very simple level if you put all your money into new hospitals it will take time to build the hospital; therefore nothing will happen for at least a year. Or, if you pump all your money into subsidies for doctors, the computer will waste some of the money for the reason that in our hypothetical society some doctors will disregard the subsidies because of personal taboos against birth control."

*The Population Game* has been used in public health administration courses and demonstrated to family planners as far away as Korea. The developers see the game being refined to a degree of accuracy where family planners will actually use it, along with the vital statistics for their nations, to "game" plans in advance to determine how to spend their money.

Indeed, as "game plans" become an important part of the decision-making process in business and government, simulation games become an important part of the reality they are designed to simulate. We have come a long way from the little green houses and red hotels stacking up on *Monopoly's* Park Place.

Illinois high school seniors, representing nations embroiled in a Korean-type war, decide next move.

*By B.P. Menon*

# The way-far-out hippiedom that was Kathmandu

French artist surveys a new day for Kathmandu from a sun-drenched balcony at Traveller's Lodge.

*Beads rattling, hair flying, Western Youth swarmed there in the late sixties, and Nepal's remote capital will never forget it*

"Oi never buy a ticket on Indian railways," said Arthur, the cherubic young Englishman. "When they coom round to check, Oi pretend to sleep and they still don't like to wake a sahib." He pulled his flaccid green Banlon shirt straight, and puffed out his 19-year-old chest, proud to be English in India.

"Don't they even try?" I asked, not quite believing, for Indian ticket collectors, underpaid, semistarved and ever on the lookout for bribes, are seldom meek.

"Ow yes they do," Arthur explained. "But they don't know how to figure me out, you see—a sahib traveling third class—and you can see 'em thinkin' Now is this a 'ippie or a sahib. Then when Oi swear at 'em they decide it's a sahib and they clear off."

That was in Calcutta. The very unhippie Arthur with his sahib attitudes was on the hippie trail to Kathmandu—overland. That was how the great hippie invasion of Nepal in the early sixties went, and young Westerners who travel the route today, be they ever so innocent of bells, beads and matted hair, are considered "hippies."

Tiny Nepal is bordered on three sides by India, lies south of China's Tibet, and west of Sikkim, with Mount Everest hulking right on its northern boundary. A third-class ticket to the border from Howrah, across the sludgy river Hooghly from Calcutta, costs less than three dollars. With a student card bought cheaply from the proficient forgers of the city, the fare is halved. Yet a sizable number of third-class passengers will not pay even this pittance and the train

Typical of Kathmandu's international set
are these three regulars at a local bistro.

bears a passenger load twice or thrice what anyone decently intended. Third-class windows overflow. There are the sweaty, stubbly farmers of Bihar, once-white clothes dyed egg-brown with wear, meager rolls of bedding and cheap tin trunks piled on the slatted luggage racks or under the hardwood seats. Among them, stiff with the dignity of literacy, sit gaunt Bengali babus and an occasional hairy Sikh with his turban off enjoying a scratch. Women open food baskets, pull children off luggage racks, feed them, wash them, breast-feed babies and put them to sleep on their laps. Ticket collectors come. One penniless peasant is thrown off the train at a small village station but clambers onto the next carriage. The slanted light of late afternoon turns increasingly blue, lights go on, the train runs through the warm starlit night.

"What is your mission?" asks a graying man of the American girl sitting opposite him. People perk up. Foreigners, especially girls, are an object of consuming interest and, now that the ice is broken, other questions come like rain: "Which country you are belonging from?" "Where from you are going to?" "You are married?" "You are student?" "You are tourist?" At this point the initiator of the conversation feels impelled to display his expertise and explains to the others that the girl is a hippie. The questioning resumes—about the size of her family, her marital plans, her father's income and other matters of general interest.

For 18 hours the train chugs north, sprinkling the countryside liberally with coal dust, stopping at little stations where tattered vendors dash about with trays of virulently colored liquids and glass cases of food crawling with flies.

As dawn sucks the mist from plumed fields of sugarcane, the train sighs into Samastipur and empties in a tumbling scurry of people. Red-smocked coolies lunge into compartments, suitcases and bedrolls fly out closely followed by their owners and everyone heads for the connecting train to Raxaul, hurrying not so

Road to "Princess" Zina Rachevsky's meditation center is as rocky as her path to salvation.

much to catch it (it will not leave for another hour) but to get a place to sit, stand or hang on. When it gets under way, people festoon doors and sit happily on roofs munching peanuts and sugarcane. An enterprising beggar goes slowly along the outside of the lurching train like a giant brown fly, holding his begging bowl in his teeth.

Outside Raxaul station wait dozens of horse-drawn tongas and jingling cycle-rickshas to take you across the border. About half a mile from the station the horse pulls up before a shambly brick building. "Sala Customs" says the driver pointing with his whip (Sala, literally "brother-in-law," is a casual insult implying the speaker's intimate relationship with the insulted party's sister). In a gloomy little room, behind a desk gray with encrusted dirt sits "Sala Customs," a threadbare individual drinking tea from a chipped cup. "Tourist?" he asks, taking a noisy sip. "Many tourists going this way," he goes on without waiting for an answer. "Many, many hippie tourists, han!" He proffers a dog-eared register to be signed. The luggage waiting in the tonga is now presumed to be checked.

Beyond is a ramshackle bridge, and across it the land of the ancient sage Ne—and Nepalese customs. A young man inspects your luggage with childlike curiosity, fingering clothes, trying out a flashlight and admitting frankly that he does not know what he is looking for because no one has told him.

Birganj, the small border town, is insect-ridden and dusty but faintly exhilarating. Convoys of gasoline trucks churn streamers of dust on their way to the capital—all of Nepal's oil is trucked in. Hills of salt lie outside storage sheds awaiting transport. Trucks laden with lumber rumble down from the hills, sugarcane is carted off to factories, and from dawn until noon, buses rattle off toward Kathmandu.

The bus labors up, past rickety villages perched on steep emerald-hued slopes. It climbs and dips and climbs again, stopping at minuscule villages for cigarettes, tea and thick biscuits, then later for lunch at a grimy hamlet perched high in the clear air. It passes pine and snow at 8,000 feet and then turns a sudden corner and, in the far distance, the Himalayas stretch against the azure sky like some white incredible dream. The bus descends then, the peaks are lost to view and a few hours later the lights of Kathmandu twinkle gently up from the velvet darkness of the valley floor.

There are more than a score of cheap hotels in Kathmandu, all of uniformly rock-bottom standard. The Traveller's Lodge stands near the center of the old city of Kathmandu, an area called the "Door of Hanuman" (the legendary monkey god who flew from India to Ceylon). It is a five-story building with the wind occasionally whistling through the corrugated tin roof. A room here with two beds is 50 cents a day. It is about 8-by-12 feet and comes with an interesting undulated floor covered with thick, filthy straw matting and walls of fading green plaster bountifully covered with graffiti dating back to 1958. A cracked shaving mirror in a rusting frame adorns one wall and a bare electric bulb dangles from a rafter. Beds are of wood, with lumpy

*"Papa" Menon (despite nickname, he is only 27), an Indian, was a writer on* The Statesman *of Calcutta before joining the United Nations and studying at Columbia. His American wife is also a journalist.*

The Princess—former movie actress, now shorn and robed—employs three resident lamas at center.

mattresses and pillows that smell of stale hair oil.

"Very good room," says the Nepali hotel boy, "very good view." He throws open the wooden shutters all along one wall revealing an expansive view of Kathmandu's huddled roofs. Not far away the pagoda shapes of temples rise over the mass of shingle and brick, and one of them, the boy says, is the "temple of king." Mist swathes the distant mountains.

The room opens onto a terrace. It is bright from the sun most of the day, and on the parapet those with nothing to do sit and look down on the busy life of Kilagal Tole, the cobbled gutter of the road below. Every morning each fifth-floor resident can ask for a bucket of hot water to be brought up, without charge, either to the terrace or to the tiny cubicle of a bathroom two flights below, and the hotel boy, assuring delivery in five minutes, will deliver it an hour later with a cheerful lack of apology.

Down the gloomy corridor, in an identical room, is Genise, a dark-eyed, raven-haired beauty from Canada. She clumps down the corridor early every morning, braving the chill in ankle boots and a towel on her way to the bathroom. Behind her bounces a bladder-shaped mongrel pup, Ling Kesar, carefully wetting every door and leaving a zigzag trail to mark his way. Genise has been in Kathmandu for six months and hopes to stay "a year of two if not forever," and meanwhile supports herself by working in a newly opened boutique. Her life seems fairly settled, and she is not often high (as almost everyone else is) on the city's cheap marijuana.

Neighbor to Genise is a plump German girl who, for the month I saw her, always wore the same dark slacks and sweater. Inger's morning ablutions consist of washing her hands in the bucket of hot water on the terrace and rubbing her eyes clear of sleep. She, too, has been in Kathmandu for six months and would rather not think of leaving. "The immigration people write me letters to go and see them," she explains with a little girl giggle, "but I write back and say I'm sick." When not playing sick she is producing excellent little watercolors or else stretched out like a huge black cat on the terrace soaking in the sun. At other times she is glooming over a broken marriage and a two-year-old child in Germany, or she is glaze-eyed with pot.

Frederick from Denmark is an ex-organ-grinder who has been on the road for most of his 40 years, going home only when really sick or desperately broke. He believes in wearing everything he owns no matter how old or tattered. "It's easier than carrying," he explains, "and it keeps me warm." Immigration has asked him to leave the country but Frederick is playing for time while trying to sell one of his two cameras.

In another room facing the terrace lives a slim, bearded French artist, and with him a lovely Danish blond who Frederick says is headed for movie stardom. They keep very much to themselves. The room they occupy is a pleasant place; the mattresses on the floor, clean new mats, the walls whitewashed and hung with expensive Tibetan tankas (silk paintings). At dawn every day the Frenchman comes quietly from his room, stands looking for a moment at the day, then goes downstairs to his bicycle and pedals away into the countryside. He returns an hour or so later with a bouquet of wild flowers which he arranges in a tall vase on the floor.

*Gone: one student grant*

On the third floor, in a dark, windowless, plywood cell lives Gabrielle, a leggy, toothy, American girl who came to India on a foundation grant to study south Indian temple architecture but spent the money traveling over the northern hills, much to the displeasure of her benefactors. She talks without seeming to draw breath but takes no offense at the nickname "Gabby." Hers is the only room with an electric heater, a typewriter, a carved wooden table from Thailand and several brass inlaid trays from India—all of which she carries on her perambulations. She is trying to get another grant and spends her time typing involved applications. "If I don't get one I'll have to keep going to Thailand?" Why Thailand? "I can make about $1,000 a month selling encyclopedias to GIs."

Thus was Kathmandu, The Scene for hippies a few

*Kathmandu—where the action was*

years ago, and they were there in large numbers, selling LSD and heroin to the curious Nepalese. Some 300 of them were rounded up and expelled from the country, the government being tolerant of marijuana and even selling it in licensed shops, but objecting to other, newfangled, drugs. The hard-core hippies are no longer in Kathmandu; only the outer fringes remain.

Among those who would almost certainly be classified as a hippie, much to her distaste, is "Princess" Zina Rachevsky, a former Hollywood starlet who saw The Light some years ago in the Indian hill resort of Darjeeling. She assumed the shaven head and red robes of a Buddhist nun, and the name Ogden Chongchup.

Zina now leads an idyllic existence at a "meditation center" she runs near the summit of a high hill. Here, in a large room plushly carpeted in white and furnished with discriminating taste, she strives toward the hard path to salvation with the aid of three resident lamas. With her at the center are her two-year-old daughter Raya, a chubby confused little thing in a miniature nun's robe mumbling snatches of English, Nepali and Tibetan; Joan, an equable American girl in her twenties, also a nun; a fey Canadian girl hugely impressed by Zina; and a mad-looking Frenchman in Biblical robes wandering the hills with a flute.

Visitors to the meditation center are welcome, especially if they bring bread, which is unavailable nearby, or contribute money which Zina claims is also in short supply. "There are no fixed activities," Zina explains, her strong but well-shaped hands smoothing her one-inch stubble of hair in an unconsciously feminine gesture. "Each person meditates on her own."

Zina's future plans for the center include a library and guest house, but at present there is not enough money so she spends her time writing (a novel) and meditating. Her trips to Dharmasala in India where the Dalai Lama lives, are hampered by the Indian government which seems to think Zina is an artful CIA agent and will not give her a visa. Otherwise she is happy, striding to the top of a hill to exclaim over a sunset turning the distant peaks to amber, or showing visitors pictures of herself before the conversion—an ash blond in tight sweaters and swimsuits.

Kathmandu is basically and unavoidably religious. No city street is without a few temples. Nepal has a total of more than 330 million deities, according to one estimate, and in Kathmandu valley alone there are more than 3,000 temples, among them three of the most famous shrines of Hinduism and Buddhism. According to legend one of these temples, Pashupatinath (Lord of Animals) with its massive doors of beaten silver, is as old as the valley itself. Kathmandu, the legend goes, was once a vast lake, ruled by a monstrous tortoise demon. One day there appeared on the lake a giant lotus—also a god who slew the tortoise, then parted the mountains with a mighty cleave of his sword, draining the valley dry. The giant lotus disappeared with a flash of light, but the stalk remained and is still worshipped to this day as the lingam, the phallic symbol of male creativity at Pashupatinath. During the festival of Shivaratri (night of Shiva, the destroyer) a horde of pilgrims congregates from all over Nepal and India. Foreigners are excluded, and a special constabulary ejects them with a great show of indignation.

Around a great stone bull sit scores of lithe young sadhus stark naked, matted hair almost bronze with dirt and exposure, eyes red from liquor or drugs. Some of them brazenly invite women in the crowds to various intimacies but these are either ignored or met with giggles. One naked young sadhu strides through the pilgrims, proudly holding trident and tongs in one hand, in the other a shiny Japanese transistor set.

*Tea-drinking lamas*

Swayambhunath temple is, as they say, a very different trip. Long flights of steps lead up to a carved stone aerie overlooking the city. Tribes of vociferous monkeys swing and chatter and taunt the pilgrims who make the long climb. In a high room cluttered with scrolls, paintings and idols, lit by scores of flickering butter lamps, maroon-robed lamas from Tibet sit in rows drinking yak butter tea and chanting prayers. At intervals the chanting stops, two monks blow a reverberating roar from seven-foot horns and the chanting continues as a little boy in monk's robes struggles around the room with a kettle as big as himself, refilling the steamy bowls. Swayambhunath is ostensibly Buddhist but actually it is as much Hindu—the two religions having melded in the precincts of the temple, as in Nepal as a whole.

The reputedly 2,000-year-old Buddhist stupa of

Bodhnath sits like a giant inverted porridge bowl a few miles from the city. From its top the Buddha's All Seeing Eyes look out in all four directions but evidently miss the activities of the keeper of the stupa, Chini Lama, who shaves himself with a cordless electric shaver in the yard below. "Best make," he says with pride, running the shaver over his plump jowls—"Remington." He selects a bottle from beside his aluminum deck chair and dabs his cheeks with Yardley's. He wears a gold brocade jacket, tapered wool slacks and argyle socks. He sits in the yard scrutinizing the tourists with shrewd little eyes, ready to talk at the slightest encouragement.

*Kathmandu's King Rat*

"You French? I know many people from French. I can speak French. Also 25 languages." But the tourists have spotted some pilgrims and shoot off with their cameras. The Chini Lama returns to his shave with the air of a car salesman who has just lost a good deal. The lama is known to trade antique tankas for bottles of French perfume for which, among several other things, he has a weakness. It is also rumored that he sells the best hash in Kathmandu, knows where the prettiest girls are and is generally the valley's King Rat.

To bleak rented houses around Bodhnath and Swayambhu the newly awakened young Westerners come, leaving cold cheap hotels for even cheaper, colder rooms. There they luxuriate in the deep philosophies of the East until one day they dream unashamed of beefsteak, apple pie and a warm bath.

Those who dream of apple pie have merely to walk down from Swayambhu toward the city and slush through several hundred yards of pigsties to arrive at Vishnu's Chi & Pie Palace. Chi is Hindi for tea, and Palace, in this case, means a tiny room with pitted walls, a crumbling floor and a shaky, deal table with two benches. But Vishnu's pie is excellent and a couple of drooling clients are always waiting their turn. There is apple, lemon meringue, pumpkin, chocolate-pineapple, chocolate-coconut and other combinations, served on yellowed and veined plates. Vishnu, proprietor, cook and waiter, was the servant of an American family who taught him to make pies and gave him, as a parting present, an oven.

Beefsteak is difficult to get for cow slaughter is banned in the world's only Hindu kingdom. But there is no law against killing buffalo, and a few feet from Vishnu's Palace anyone can watch. The animal is killed by driving a sharp knife into its brain at a point behind the ear, whereupon it does a shuddering dance, bites its gray tongue and dies in a spray of blood. The twitching body is packed in straw which is set on fire to burn off the coarse body hair and make

Dressed in the mode of the city, a bead-fingering transient contemplates a richly carved shrine.

A brace of visitors seeks easy answers from a culture crumbling under its unsolved problems.

skinning easier. When the fire dies down, the carcass, stiff-legged and hard, is cooled with buckets of muddy water, scrubbed clean of ash and the round black belly sliced open. "Buff steak" in the small restaurants of Kathmandu is both cheap (20 cents) and tasty, served with a mountain of green, boiled vegetables.

For breakfast, the best place in Kathmandu is the Camp. A few years ago it was something of an institution, serving as information exchange, trading center and headquarters for travelers, but then the manager, a personable young Indian dropout from the Shell Oil Company office in Bombay, fell in love with a Swedish girl and, unable to face the resulting complications with his wife and family, attempted suicide, fell into debt and finally left for places unknown. The kitchen still serves up delicious jam pancakes, grilled cheese sandwiches and the best hot lemon drinks in town.

The Capital, another popular place, has ten tables set so close in two small rooms that conversations are carried on across two or three tables without the slightest inconvenience. The owner-manager is a prune-faced refugee from China who inexplicably wears Mao buttons. The food, ranging from mou-mou (fried or steamed dumplings) for ten cents a plate, to a heaped platter of chop suey for 20 cents, is among the best in the city, and the Capital is full from lunch time to late at night with a strange mix of people.

Eudora, a gray-haired lady who spent her youth as a teacher in Peking and is now on a cheap trip around the world, is accepted by a crowd young enough to be her grandchildren. "I wouldn't stay in a cheap hotel in the Middle East," she says; "there's still a lot of white slave traffic." A blond blue-eyed Californian more than six feet tall says, "It doesn't matter if you're man or woman, if you have light hair and blue eyes you've got to watch your step." Michael, a loquacious Englishman, holds forth on how India suffocated him; Kurt, a German, excitedly repeats his discovery of a two-rupee room with not only a "fantastic view" but "also a light I can switch off from bed!" And so it goes, till finally the owner's two, small, almond-eyed daughters are dragged sleepily out from under tables, fed their dinner and put back to sleep, the signal for everyone to leave, shivering slightly, into the silent streets.

The Ling Kesar restaurant appears unpopular. I remarked once on the lack of clientele, but the owner grinned. "Upstairs," he said, gesturing me past a dirty curtain in the back of the room, and up two flights of creaking steps. The room upstairs was dimly lit, heavy with the smoke and sweet stench of marijuana. There was no furniture, but on mats along the four walls people sat half asleep or talking in subdued murmurs while boys moved quietly around serving tea and food.

In the small restaurants where overland travelers meet, the conversations turn with inevitable regularity to the destruction of old, charming Kathmandu, a process evident every day in a hundred symptoms of growing modernity. For Kathmandu is no longer Shangri-La—its narrow cobbled streets clot ever more frequently with honking Toyotas and Mazdas. On New Road, the City's main shopping center, there is, of all things, a well-stocked Dior salon—and other shops sell everything from Italian shoes to Russian cameras. A casino does brisk business with roulette and blackjack and the super-cool sophisticates of the local turboprop-jet set twitch on dance floors to the sound of acid rock.

Yet the past hangs heavy. Houses that line narrow streets recall the time when Nepal produced some of the best wood carving in Asia—intricately latticed and carved "peacock windows," exquisitely worked doors and balconies. Streets expand periodically into temple squares with bells, ancient statuary and sometimes an idol with a diamond eye housed in a silver shrine. Holelike shops sell bamboo ear-cleaning sets tipped with ivory, jade snuff bottles and old Chinese brocade. Rangy Tibetans walk the streets like tattered lords, their loose chubas sometimes hiding a litter of pups for sale. Traffic jams are often caused by the necessity to half-persuade, half-wrestle some shy peasant woman into a taxi for her first car ride.

But finally it is none of these things nor countless others that give Kathmandu valley the lingering flavor of Shangri-La. It is something in the mountain air, something charmed in the white circle of Himalayan snow that makes this a distant world despite the planes that wing in over the mountains and the young intruders on the hippie trail.

The native young Nepalese of Kathmandu parade. The banner bears the name of a local school.

Under a huge map of Philadelphia, McHarg ponders ecological schemes for the U.S. bicentennial.

*By Irenè Kiefer*

# An angry advocate for nature's plans

*An outspoken maverick among planners, Ian McHarg insists the land can tell us how to develop it, if we will just listen*

Ian McHarg, who has been called one of the new breed of architects and planners, sat in his cluttered office in Philadelphia, chain-smoking. Suddenly he jumped up, scrambled onto a table covered with books and maps and reached up to open the window located near the ceiling.

"I wonder if the architect thought about this." Then he added, "I wonder if they think at all."

It is not just architects who are the victims of McHarg's sweeping generalizations. With a rolling Scottish burr in which you can hear Highland preachers of old damning sinners to eternal flame, McHarg regularly blasts modern sinners against the environment.

"It is surely the highway commissioner and engineer who most passionately embrace insensitivity and philistinism as a way of life and profession." McHarg has done battle with these particular philistines, and in one instance, on New York's Staten Island, he won.

"The economists," he has written, "with a few exceptions, are the merchants' minions, and together they ask with the most barefaced effrontery that we accommodate our value system to theirs." For the land has its own value system, McHarg insists, and these values can be incorporated into a development scheme. The land tells us how it should be used—if we will only listen.

McHarg, self-appointed spokesman for the land, is the voice that more and more people are hearing. A landscape architect and partner in the Philadelphia

*The author has written on bioluminescence and shark research in earlier issues of* SMITHSONIAN.

firm of Wallace, McHarg, Roberts and Todd, he was one of the first to embrace—with nearly mystical completeness—the gleanings of ecology and to insist on their primary role in regional planning. In the last ten years, he has provided development studies for a rural section outside Baltimore, for Staten Island, the Potomac River Basin of Washington, the entire Minneapolis-St. Paul metropolitan region and, currently, for the Denver region.

He is in almost constant motion here and abroad, spreading his gospel of ecological planning by television appearances and lectures to students, officials and private groups. For example, one night he turned up alone on a high school stage on the New England island of Martha's Vineyard. Waving his arms, chain-smoking in defiance of a no-smoking sign beside the stage and periodically calling for water, he harangued a slightly bewildered audience invited by the local garden club on the crimes of man against nature.

He asked the assembled islanders to consider Versailles where Louis XIV lay transected by the twin axes of the geometry of his gardens, "testimony to the divinity of man and his supremacy over a base and subject nature." Here was an ultimate symbol of Man separated from the natural world. The example may have been lost on the garden club. But McHarg's incessant theme—that if Man sets himself up as a conqueror of nature the result will predictably be "the squalid city and the pathetic subdivision"—is beginning to catch on. It has caught on most rapidly at the University of Pennsylvania's Department of Landscape Architecture and Regional Planning where McHarg is chairman. One of three U.S. graduate programs totally committed to ecological planning, Penn has 90 students and a faculty of 20 which includes not only landscape architects and regional planners, but natural and social scientists.

*A reaction to Glasgow*

McHarg's dedication to ecological planning is relatively recent. During his early years at the University of Pennsylvania he espoused the orthodox type of planning that considers only social benefits and economic costs. But planning that relies so heavily on economics, McHarg knew even then, cannot provide a way to escape either ugliness or, more importantly, ecological disaster. He could not forget the contrast between the beautiful Scottish countryside where he grew up in the 1920s and—just ten miles distant—Glasgow, which he remembers as "one of the most implacable testaments to the city of toil in all Christendom, a memorial to an inordinate capacity to create ugliness, a sandstone excretion cemented with smoke and grime." Cities do have their oases of delight, he admits, but rarely are they the result of the Industrial Revolution and its aftermath.

By the early 1960s, McHarg had begun to try integrating natural sciences into the planning process, and before long his firm was asked to provide an alternative scheme for a five-mile section of the Richmond Parkway which threatened Staten Island's green belt —or the "greed belt," as McHarg calls it.

The best route for a highway, McHarg proclaimed, is one that provides the maximum social benefit at the minimum social cost, not necessarily the shortest distance between two points.

*X-raying an island's social values*

The study first considered the usual engineering criteria—slope, surface drainage, soil drainage, bedrock foundation, soil foundation and susceptibility to erosion, assigning three values to each criterion. Each of these physiographic features was then mapped on a transparent map so that the darker the tone the greater the cost to build the highway. Another map was made showing the danger of flood inundation from hurricanes, the darker the tone the higher the danger. Finally, McHarg evaluated natural and social processes —land values, historic values, scenic values, recreation values, residential values and institutional values— once again, the darker the tone, the higher the value.

These maps were then superimposed, one atop the other over a light table. Like an X ray, the composite map revealed darker areas where social values and physiographic limitations were high. The green belt loomed as the area where both values and limitations were at their highest, but lighter toned areas appeared, where the parkway could be built at the least social cost. The Transportation Commission reversed its decision to cut through the green belt with the Richmond Parkway and accepted the alignment recommended by the study.

Not all of McHarg's plans have met such a happy fate. "Many of our clients are unable to understand our plans," McHarg asserts. "Planning commissions usually consist of people with socio-economic backgrounds, and many of them just don't appreciate ecological planning.

Looking back on his early efforts, McHarg considers them rather primitive: "We were only enthusiastic amateurs in natural sciences. We had to rely on published information, which usually didn't fit our needs."

McHarg's strategy is simple. Basically, he only integrates scientific information to let it *do work,* to force it to play a role in the conduct of human affairs.

But if the idea is simple, the procedure is complex. First there is the painstaking effort of assembling data; then quantifiable values must be assigned to natural

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processes and natural phenomena. The theoretical problems involved in this pioneering task have yet to be worked out to McHarg's satisfaction.

In recent years, more sophisticated techniques have become available to him. Instead of relying only on published information, McHarg now has been able to send highly qualified scientists into the field to gather data and sometimes to use satellite and aerial photography. His maps can be read by a digital scanner located at the University, and the information can be stored in the computer's memory. In seconds the computer can print out a shaded map showing, for example, areas intrinsically suited for urbanization, or another showing areas which should be preserved.

Some areas may be put to multiple use without compromising the intrinsic values. Where two uses are equally suitable, the community must make its choice. This is the beauty of ecological planning, McHarg says. It permits the community to identify and incorporate into planning whatever values—spaces, places or buildings—it cherishes. Yet it remains an "embryonic method," McHarg admits. "We are at best on the edges of true ecological planning."

His most elaborate effort to date is "an Ecological Study of the Twin Cities Metropolitan Area," completed in 1969. In studying this 3,500-square-mile area, 80 percent of which is still open land, McHarg started by compiling and mapping basic data on all the natural forces at work. In the Minneapolis-St. Paul area, the number of categories climbed to about a dozen.

From this "ecological inventory," he developed an ecological model, which represents the area as an interacting system—for example, climate affects geology and geology affects hydrology, all of which determine soils which influence plants which affect climate. Finally, the ecological model was examined to identify those specific factors which affect how the land should be used.

The hydrological study was especially detailed, and McHarg asked Dr. Ruth Patrick (see SMITHSONIAN, August 1970) of the Academy of Natural Sciences in Philadelphia to review it for him. She discovered extraordinary amounts of nitrates in the water, the result of sewage and fertilizer runoff. Since nitrates can result in the birth of blue babies, Public Health Service standards require that drinking water contains no more than 45 parts per million. In the Twin Cities there were local incidences of blue babies.

With that kind of introduction, the McHarg group's ecological study received a lot of publicity. As he ticks off a list of actions that have been taken in the Twin Cities in the past couple of years, McHarg is obviously proud of the role his study played:

- The State passed floodplain and lakefront zoning, barring development from significant amounts of land.
- The Twin Cities Metropolitan Council was empowered to locate sewers and sewage-treatment plants, to issue bonds to fund such projects and to intervene in transportation matters. Thus the Council can channel development into areas where it should go.
- The Council can regulate how land should be used. Recently tight restrictions were imposed on where a new airport could be located and how it should be designed, particularly with regard to potential water problems.
- The Council was given a lump sum, plus five cents from the sale of a package of cigarettes, to acquire open space. The ecological study indicated a pool of lands

McHarg cajoles one of his many graduate students in landscape architecture.

in which open space should be acquired. The lands are those where development would be hazardous to life and health because, for example, foundations would be subject to subsidence.

Says McHarg in another of his sweeping observations: "The Twin Cities Metropolitan Council is the most effective regional government in the United States today." He is enthusiastic about the Twin Cities for another reason—one of his former graduate students is now working for the Council.

Currently McHarg's operations include an ecological study of a nine-county area around Denver and a search for an intrinsically suitable site for a new town near Houston, Texas. In this effort, McHarg's group, which now includes social and even medical scientists, seeks to push ecological planning into a full-fledged, practical human ecology.

In an eloquent and map-filled book McHarg produced in 1969 entitled *Design With Nature,* he recalls the 18th-century landscape architect Lancelot ("Capability") Brown, who landscaped a considerable fraction of the English countryside (see SMITHSONIAN, November 1971). When he was asked to do some work in Ireland, Brown is said to have replied: "I am sorry. I have not finished England yet."

In these times when Congress and the Nixon Administration are calling for a national land-use policy, it does not take a great mental leap to imagine the familiar silhouette of the entire United States shown in the bright color-keyed mosaics of McHargian maps.

Critics would scoff at the idea. His plans are often impracticable, they say or, more sympathetically, they suggest that McHarg will simply burn himself out. He himself is not satisfied. He lusts for more and more hard scientific data and constantly presses scholars into the task of refining and perfecting his theoretical approach. But McHarg is a particular kind of warrior—armed not only with maps and what Stewart Udall has called a "damn the torpedoes" approach but with supreme faith that he is right, that the land can tell us how we should live on it. A tall man with a bristling moustache, his technique is to surround and overwhelm his audience—be it a group or a single student—with rolling, adjective-filled sentences and rapid-fire ideas. Some people say McHarg is a fanatic. Others, in his defense, answer that a fanatic is a prophet who has just walked into the room.

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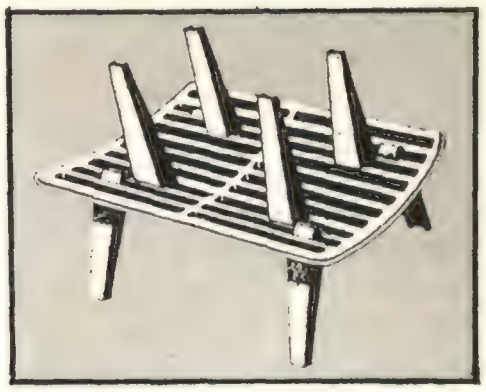

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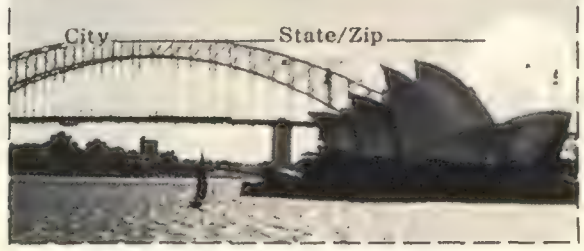


At its height, the Alexandrian Museum's scholars had laid much of the groundwork of science for the next millennium, edited the literature of the Greeks and invented such devices as the wind-driven water organ (above) and a primitive steam "engine" (the round object below). They may have been familiar with an elaborate astronomical calculator (on the table) that was invented elsewhere during the same period.

*By David E. H. Jones*

# A final creative gasp and then the Museum fell

*In the last of two articles, a British scientist tells of decline in Alexandria and of the institute's destruction by militant Christians*

In part one of this article last month we saw how in the third century B.C. Ptolemy I of Egypt founded the Alexandrian Museum and Library to be the cultural center and showpiece of his new capital city. We became acquainted with Euclid, Eratosthenes and Hero and other scientists whose achievements graced the Museum during the centuries that followed, and we met Aristophanes and Aristarchus, two of the Library's great editors without whose efforts we would have lost much of the literature of the Greeks.

Under later generations of Ptolemaic kings, however, political intrigue took its toll of the quality of Alexandrian scholarship and the free environment in which it was carried out. Under Ptolemy VII (145-116 B.C.) the Museum was closed down. It later reopened but never regained its previous glory.

Throughout the early centuries of the Museum's existence, the power of Rome had been increasing, until by about 150 B.C. it was the dominant power of the Mediterranean. The later Ptolemies pursued a steady foreign policy of picking the winners, so Egypt allied itself with whoever seemed in the ascendant at Rome. Accordingly the defeat of Pompey by Caesar in 48 B.C. caused an abrupt switch of allegiance by Ptolemy XII.

When a little later the victorious Caesar arrived in Alexandria with a small army, Cleopatra VII, sister and wife of Ptolemy XII and joint monarch, saw this as a chance to depose her brother. (She made such a profound impression on Caesar that he later moved her to Rome and gave her a son.) Her underhanded strategy perturbed Ptolemy XII, who accordingly launched a preemptive strike at Caesar in the Royal Quarter. During the fighting, Caesar burned the Egyptian fleet in the harbor for fear it should be used against him. The flames spread ashore, and at one time historians believed that the great Library itself had been destroyed; however it is now thought that only some dockyard warehouses of books awaiting shipment perished.

Roman reinforcements arrived for Caesar. Ptolemy XII was killed and Cleopatra returned to Rome with Caesar, with every prospect of using her charms to further the role of Egypt in the Roman empire. Unfortunately, Caesar was assassinated in 44 B.C. and Cleopatra was forced to cultivate his lieutenant Antony (he gave her twins). But Ptolemaic foreign policy had made a fatal mistake: And when rivalry for Rome again developed, Antony was beaten by Octavian at the battle of Actium (31 B.C.). Even Cleopatra's charms were not enduring enough to beguile the victorious Octavian, and she committed suicide rather than be carried back a captive to Rome.

She had played the ruthless game of power politics with skill and determination, staked her life on the outcome—and nearly won. Despite some second-raters in between, the last of the Ptolemies had shown the same spirit as the first. But with her death, the Egypt she had fought to save from foreign domination became a province of the Roman empire.

## *Scholarship under the Romans*

We owe a great debt to the Romans. These practical, hardheaded people, who never made a discovery in pure science, subdued a Hellenistic civilization quite different from theirs, whose achievements they could have blotted out of history merely by ignoring them. And yet they adopted Greek art and learning with uncritical enthusiasm and fostered them throughout their empire.

In Alexandria, conscious of the reputation of the Museum, they tried to support and consult it as the Ptolemies had done. In his brief reign, Julius Caesar decided to introduce a rational and universal calendar to replace several old systems which were getting badly out of step. The system worked out for him by the Alexandrian astronomer-mathematician Sosigenes, with its leap year every four years, is (with minor modifications) still the one we use today. Caesar celebrated his initiative by naming one of the months—July—after himself.

But in the first 150 years of Roman rule, the Museum produced almost no important scientists (Hero, whom we met in Part I, is an exception), and Roman

administration seems to have been discouraging and incompetent. In about 50 A.D. the emperor Claudius decreed a new establishment, the Claudium, whose sole activity was to give an annual reading of his own historical works. Not surprisingly, it acquired an enthusiastic staff of spongers but no academic reputation.

In 130 A.D., Hadrian, who had a great interest in Egypt, visited the Museum in Alexandria, and made his old tutor Vestinus its manager. A depressing retinue of emperor's favorites, hack writers and hangers-on was recruited, and the Museum became a backdrop to social frivolity. Yet very possibly Hadrian thought he was doing the ancient foundation a favor.

The Museum recovered even from this indignity, and by 150 A.D. another of the giants of antiquity was working there. He was Claudius Ptolemy (not to be confused with the rulers of these names), and his two great treatises, the *Almagest* (on astronomy) and the *Geography,* became the summit of European knowledge of Heaven and Earth for over 1,300 years.

So sketchy are the historical sources for the period that we cannot even be sure that he was a member of the Museum; but his work leans so heavily on past Alexandrian achievement that he must have worked continually in its Library. By 150 A.D. the age of creative innovation in science was long past, and Ptolemy's main achievement was to extend and systematize the work of the geographer Eratosthenes and the astronomer Hipparchus, begun 300 years previously.

We have already seen how Aristarchus of Samos' prophetic heliocentric theory of astronomy was rejected by antiquity. Hipparchus of Nicaea (190-120 B.C.), the greatest Hellenistic astronomer, leveled several reasonable criticisms at it. Among these was the damning fact that, with the circular orbits assumed by Aristarchus, it predicted positions for the planets which were simply wrong.

Hipparchus was not a member of the Museum, though some of his observations were made in Alexandria. But his meticulous and extended observations of the heavens, which led him to discover and measure slow stellar effects like the precession of the equinoxes, and to obtain a value for the length of the year less than 6½ minutes in error, were filed in the Alexandrian Library.

He sought to account for the movement of the sun, moon and planets by assuming them to move around the spherical Earth in either eccentric or epicyclic trajectories or a combination of both. The idea, suggested by Apollonius of Perga at the Museum, is that if you cannot fit the motion of a planet to a uniform circular path around the Earth, you can "refine" your prediction by imagining a point traveling in such a path, and letting the planet describe a little circle (an epicycle) around that point. If the combination still does not fit, you can add a second epicycle, and so on.

To devise a complete and accurate epicyclic model of the heavens is a truly heroic enterprise, at which Hipparchus never succeeded. Ptolemy did. Supplementing his predecessor's superb observations with his own and sharpening the mathematical tool of trigonometry invented by Hipparchus, Ptolemy produced a working model of the heavens so perfect that there was no way of showing it to be incorrect until the coming of telescopes.

This monumental achievement was the ultimate refinement of geocentric astronomy. Not until the Renaissance revived Aristarchus' revolutionary concept of a spinning, orbiting Earth, were its predictions bettered and its ancient religious assumptions abandoned. For indeed, the ancients insisted on representing heavenly motion by circles and concatenations of circles on almost religious grounds. The heavens, they thought, were different from and more perfect than the Earth, and the circle, as the only perfect figure, was the only trajectory possible to heavenly bodies.

### *Astrology and fruitful error*

The same esthetic background made both Hipparchus and Ptolemy, careful scientists though they were, accept that intellectual cancer of the ancient world, astrology—which finally was shown to be absurd in the 17th century when Newton proved the physics of the heaven and the Earth to be exactly the same. Yet even in the epicyclic decomposition of planetary orbits, that uncanny Alexandrian sureness of touch is apparent. The decomposition is entirely equivalent to analyzing an irregular motion into its component frequencies, a process whose necessary feasibility was shown by Fourier in 1822.

In his *Geography*, Ptolemy defined the surface of

The Museum's last great achievements: Claudius Ptolemy mapped the world and froze the planets in epicyclic orbits around the Earth until the Renaissance.

the Earth as finally as he had done the face of the heavens. Combining the data of his predecessors with later information from Roman travelers and traders, he constructed a grid of longitude and latitude for the spherical Earth, and ways of projecting it onto a flat surface to portray every part of the known world; and his map was definitive for more than a millennium.

Curiously, one of Ptolemy's errors was more fruitful than many of his correct statements. He did not use the correct value of the circumference of the Earth established by Eratosthenes in the Museum, but a later, smaller one of 17,600 miles. He also overestimated the length of the Eurasian continent, making it extend halfway around the globe instead of only one-third around. Much later, this made Columbus' plan to sail westward to India seem misleadingly feasible, a fact whose immense impact on human destiny is still hard to assess.

The fate of the Museum is bound up with that of turbulent, magnificent Alexandria itself. The political situation in the city, with the Romans increasingly dominating the Greeks and native Egyptians hating both, was explosive: Revolts, always put down with appalling severity, punctuate its later history.

In 216 A.D. the brutal emperor Caracalla ordered a purge of the city. Many citizens died, the Museum funds were cut off and its members cruelly treated and even expelled. In 270 and again in 295 A.D. Alexandria became a battleground of revolt, and the Museum buildings, now over 500 years old, were destroyed. Even this disaster was not the end, for it seems that the great temple of Serapis, part of which had long housed the "daughter" Library, became the headquarters of those scholars who remained.

The Museum finally fell before the advancing tide of Christianity. The early Alexandrian Church, its membership drawn mainly from the subjugated masses to whom the new religion made its strongest appeal, was racked by heresy within and challenged by powerful Jewish and pagan elements without, including that imposing monument to pagan learning, the Museum.

When, after 313 A.D., Christianity became first tolerated and then the official religion of Rome, the passionate beliefs and hatreds of the early Christians acquired a new importance, and by 380 paganism was being stamped out all over the empire. The Museum, made more intolerable by its location in the temple of

Serapis, was an affront to the Faith which could no longer be endured.

Among the scholars of the time were Theon, a mathematician important as an editor and transmitter of the works of Euclid and Ptolemy, and his daughter Hypatia, also famous for her philosophic and scientific studies. They are the last recorded members of the Museum. In 391 the temple of Serapis was sacked by a Christian mob. Its interior was gutted, the priceless Library burned, and the shell converted into a church. And in 415, under the inspiration of the fanatical Saint Cyril, Hypatia was seized by the mob, dragged into a church and sadistically lynched. A triumph of Faith over Reason was complete. The Dark Ages were at hand.

Does the 700-year-long story of the Museum at Alexandria, its swift rise to greatness and long decline, have any message for us today? It is always good to be reminded that we have no monopoly of wisdom, that the greatest of the ancient scientists were, considering the handicaps under which they worked, fully the equals of any in our own time. If our achievements stand unquestioned as long as those of Archimedes or Ptolemy we shall be fortunate indeed—or as unfortunate as they, whose work found no successor for a thousand years. Many historians have seen in Roman and Hellenistic civilization analogies to our own. The explosive dispersal of the previously parochial Greek culture by Alexander the Great's conquest, and the later spread of Roman power, threw together and mutually challenged all sorts of beliefs and outlooks and life-styles, just as in the past three centuries imperialism and technology-based communications have brought the four corners of the world into an uneasy confrontation.

*The retreat from vigor*

The ancients ultimately shrank from their challenge. Their empires crumbled; and science, that kings had once been proud to support, lost its momentum as the best minds turned instead to devising systems of personal consolation in a changing and unstable world. This retreat has been called the "failure of nerve" of the ancient world. It marked the end of the bold, confident spirit of classical Greece and early Alexandria, and the beginning of an ever more desperate search for comforting myths: detached personal philosophies, semi-rational illusions like astrology and the sheer irrational mysticism of revived Persian cults like Mithraism. The rejection of the world in the search for personal salvation reached its culmination in Christianity, which set its faith beyond reason and understanding.

Perhaps we face the same challenge again today. Our world too has left stability behind in a great upheaval of new knowledge and political ideas. It is tempting to see the Victorian era, whose entrepreneurs invested their science and technology and expansionism with a style and confidence so rare today, as the pinnacle of modern times, with our own century by contrast a period of weakening resolve.

Maybe we are seeing, in the modern rejection of "irrelevant" science, a hint of that ancient retreat from the rigor and neutrality of objective truths to the

consolations of private gratifications and ideologies, which over the centuries sapped the creative impetus of the first scientific research institute in the world, and finally scattered its rubble in the city streets.

The spirit of learning, however, did not vanish with the collapse of ancient culture in Western Europe. With each revolt or upheaval, scholars scattered—to Pergamum, to Constantinople, to Baghdad. And, as Rome decayed, the Hellenistic tradition was taken up into Arabic civilization. Throughout the Dark Ages, Arabic workers preserved and extended the knowledge of the Greeks, so that many Hellenistic treatises have survived only through their Arabic translations.

When Western culture began, at long last, to revive, this Arabic scholarship became a powerful stimulus. And so many of those early ideas, in the extension or refutation of which the men of the Renaissance turned Europe again to face an ancient challenge, came down to us via this long detour from the wonderful Museum at Alexandria.

In 415, Faith triumphed over Reason. The Museum was in ruins, its last scholar killed by Christians.

# Our land as it was: A few vestiges can still be found

*Amid highways, shopping centers and car lots, ancient trees and clumps of tall grass recall the years of beauty for young America*

The story is told of a timber cruiser in the Maine woods who recently found a clump of giant white pines still bearing the mark of the broad arrow—the colonial surveyor's brand that set them aside to become Royal Navy masts. All ancient trees are not so hard to find. Shenandoah and Great Smoky Mountains National Parks have many acres of the vast eastern forest that rose like a cathedral around the first European settlers. The park service's Registry of Natural Landmarks lists notable forest remnants in Pennsylvania and Ohio and even some splendid virgin white oaks on Gardiner's Island, off the tip of Long Island.

Prairie grass is harder to come by. Badlands National Monument and Wind Cave National Park, both in South Dakota, preserve it—and some of the bison, too. Many national wildlife refuges also boast prairie.

Canebrakes, once an impenetrable nuisance in the Mississippi Valley, are almost gone. In back lots (presumably with little real estate value) patches grow.

Though sadly depleted and perilously threatened, western forests are still magnificent and available. Parks such as Redwood, Sequoia, Kings Canyon and Yosemite contain some of the best. Wilderness areas in both national parks and forests guard fine stands to delight those who will leave their cars and rough it.

Plot of Louisiana canebrake, though no longer a jungle, could still hide a horseman.

Untouched cypress decks Corkscrew Swamp in the Everglades. Virgin area is a haven for wildlife.

Wild prairie grass still tangles a meadow's edge in Kansas where Coronado saw an ocean of it.

Little of this sod has not been "busted" by the deep-biting plows of land-hungry settlers.

Bright acres of mountain laurel run riot still
in the southern highlands of Appalachia.

Season's turn changes the hue of a hidden valley,
still clean in California's Yosemite park.

*By John Bakeless*

# Our land as it was and is no more

*We have preserved a little of what our forefathers knew, but if we were transported to their time, we'd hardly know the place*

Primitive North America—the land as it was for perhaps 30,000 years between the coming of the Indians and the coming of the Europeans—was an incredibly rich and beautiful place. Everywhere lay beauty—autumn foliage in masses we shall never see again; crystal lakes and rivers, except for muddy prairie streams, and the great sweep of the Father of Waters; colored deserts; the glittering Rockies—which the first white viewers called the "Shining Mountains."

Among other blessings—shared by perhaps three-quarters of a million Indians and no one else—were prairies teaming with buffalo in herds that would pass all day without end; lordly moose along the lake shores; deer everywhere. Wild grapes roofed much of the eastern forests; there were wild fruits of many kinds; plentiful fish in every lake or stream; oysters nine inches long—or longer—in great clusters, which some fortunate dwellers on Manhattan Island simply pulled out of the clear waters before their shelters; lobsters beyond 20 pounds, easily caught; wild turkeys in flocks so large their gobbling in the morning might be deafening; passenger pigeons that literally did darken the sky. There were grouse, prairie chicken, ducks of every kind, wild geese so fearless that at times they tried to frighten off approaching hunters.

There was nothing you could call pollution, though neither was there anything you could call sanitation. Human beings were too few to make much trouble for themselves, their power to pollute and destroy was too limited. If an Indian village grew, perhaps, a trifle whiffy it was easy to find a new, clean site a little farther off. The woods and plains Indians were migrants anyhow, following the buffalo or caribou herds, moving to winter trapping grounds, setting up temporary fishing or hunting camps, going to the seaside to "salt," or pausing long enough to raise a crop of corn.

Indians with permanent villages seem to have had no sanitary troubles. The pueblo of Acoma in New Mexico, inhabited long before the coming of the Spanish and inhabited still, has always continued in its ancient way, obviously much happier than the white man's tortured cities.

No chimneys, automobiles or planes poured sulfur or carbon compounds into the sky. No electric power lines of tremendous voltage slashed the forests or disfigured the landscapes. No factories poured acid wastes into creeks and rivers. No generators loosed floods of scalding water to kill fish. No dams blocked shad or salmon from running upriver to spawn where they had themselves been spawned, and the rivers were not open sewers. Such littering as there was turns out to be useful to modern archaeologists. One finds a mess of broken pottery sometimes, scattered about ancient archaeological sites, and of course huge mounds of the shells of clams, mussels and oysters.

There were no piles of shattered automobiles, but fertile woods and plains; no huddled tenements, but bark or buffalo-hide tepees, earth houses, pueblos; no roadside advertising or filling stations, only green woods and prairies filled with waving grass and blossoms; no hot dog stands, only a few flickering campfires roasting venison or buffalo hump or fresh-caught shad or salmon, wild geese or pigeons. There was a certain risk of being scalped—but nothing like the income tax.

Man, to be sure, sometimes managed to be vile. Many Indians tortured prisoners. There was perpetual raiding, killing, burning and general destruction. But life in the villages was rather pleasant. Children were, perhaps, too much indulged. One chief was horrified when Lewis and Clark had a soldier flogged for dereliction of duty. You certainly ought not to do that to a warrior, he said. If you did it to children, you broke their spirit.

When little white boys were captured and raised among the Indians, they frequently objected to being rescued. Sent back under treaty agreements, they sometimes had to be tied to prevent their fleeing from freedom in white civilization to the joys of captivity in an Indian village.

*Teacher, editor, lecturer, Mr. Bakeless has written books and articles describing what our first European forefathers found. His book on exploration,* The Eyes of Discovery, *was widely acclaimed.*

The landscapes of this early paradise were wholly unspoiled. Forests, mainly evergreen, covered most of New England and adjoining Canada. Deciduous forests, with still some evergreens, took over somewhere around the Hudson River and swept on into the West. They gradually thinned to "oak openings" beyond the Ohio, eventually yielding to the prairies as they approached the Mississippi. The prairies were covered with waving grass (hence the buffalo) and brilliantly colored flowers.

Grass grew to tremendous heights. On the fertile Susquehanna floodplain it was so high a man on horseback could hardly see over it. There was plenty of man-high grass elsewhere, too. I have grass like that on my Connecticut farm, even today, but there isn't very much of it anywhere. Along the Ohio and Mississippi and other rivers grew the cane, huge jointed stalks with flowing leaves. In frontier days, cane grew on some of the most fertile land and so grew 30 or 40 feet tall. Now all that land is occupied by crops, and modern canebrakes are pitiful shrunken copies of the old canebrakes of pioneer days, which might extend over 100 miles. A cavalry commander, looking at his troops and their horses straggling through one of these brakes, thought they looked like "a company of rats traversing a sturdy field of grass."

Beyond the prairies rose the Rockies and, farther west, forests of huge trees. Lewis and Clark observed trunks of 200 feet on the way to Oregon, and these were not the California "Big Trees" (redwoods, or Sequoias) which towered well above 300 feet. The big redwood tree from which Palo Alto, California, took its name was not really large as redwoods go—only 140 or 150 feet in height—and it was probably a good deal shorter when the Spaniards saw it, 300 years ago. But the first two astonished exploring parties who saw it had no idea that giants vaster still awaited them a little farther north and paused to measure it. As they went on, they found trees so big that "eight men all holding hands could not span one of them." One of the party amused himself by riding his horse into the cavity of one trunk. "Now I have a house in case it rains!" he exclaimed.

These trees were either *Sequoia gigantea,* or the other and related species, *Sequoia sempervirens.* Not knowing what to call these giants, the Spaniards named them for the color of the wood, *palo colorado.* Hence they are "redwoods" today—such of them as greedy lumber barons have left.

It seems a pity that the devoted missionary priests who wondered at the giant trunks never knew that these trees had been standing since their Master walked the roads of Palestine. Even more ancient were other conifers, the bristlecone pines, which the Spaniards never saw because they grow only at 8,000 to 11,000 feet in the mountains of eastern California. And even older than these is the rather rare box huckleberry whose rate of growth is known from observation. Several plants of it have been growing in Pennsylvania for a period estimated at between 5,000 and 10,000 years.

The new land held many pleasant surprises for the first explorers. Columbus noted that an offshore breeze brought "so fair and sweet a smell of flowers or trees from the land, that it was the sweetest thing in the world."

Among the pleasant scents that reached explorers'

Passenger pigeons once darkened the prairies when they passed overhead. The last one, "Martha," died in the Cincinnati zoo in 1914.

ships was the smoke of Indians' large cedar wood fires, perhaps also forest fires burning cedar groves. Giovanni da Verrazano, in 1524, caught the odor at 100 leagues (he may have overestimated the distance), "when they burned the cedars and the winds blew from the land." Raleigh's colonists in July 1584, off "Florida," which probably meant any part of the coast south of Virginia, reported "a most dilicate sweete smel, though they saw no land."

One voyager says this was "so strong a smel, as if we had bene in the midst of some delicate garden abounding in all kinde of odoriferous flowers." A Dutch vessel, sailing for Delaware Bay, on December 2, 1632, "smelt the land, which gave a sweet perfume, as the wind came from the northwest, which blew off land, and caused these sweet odors." There were no wildflowers growing at that time of year, of course. The Dutch thought the fragrance was due to the fact that "the land is full of sweet-smelling herbs, as sassafras, which has a sweet smell."

*Pine scent of the East Coast*

The pine forests, vastly larger than anything we have today, sent out an aroma of their own. A Quaker immigrant aboard the ship *Submission* out of Liverpool for Philadelphia, in 1682, noted in his diary: "The wind being west we smelled the pines, supposing ourselves not to be within 80 leagues." In the 19th century, Augustus John Foster, biographer of Dickens, noted that "long before we saw land we could smell the pines." Modern yachtsmen, well out at sea, occasionally have the same experience along a few parts of the coast today.

American woods are still sometimes fragrant. I myself have been suddenly stopped by a scent—a crowded growth of the little white swamp violet, not more than an inch or two above the ground, sending up a perfume so intense that it fills the air all around, or partridge berry blossoms, lying flat upon the ground.

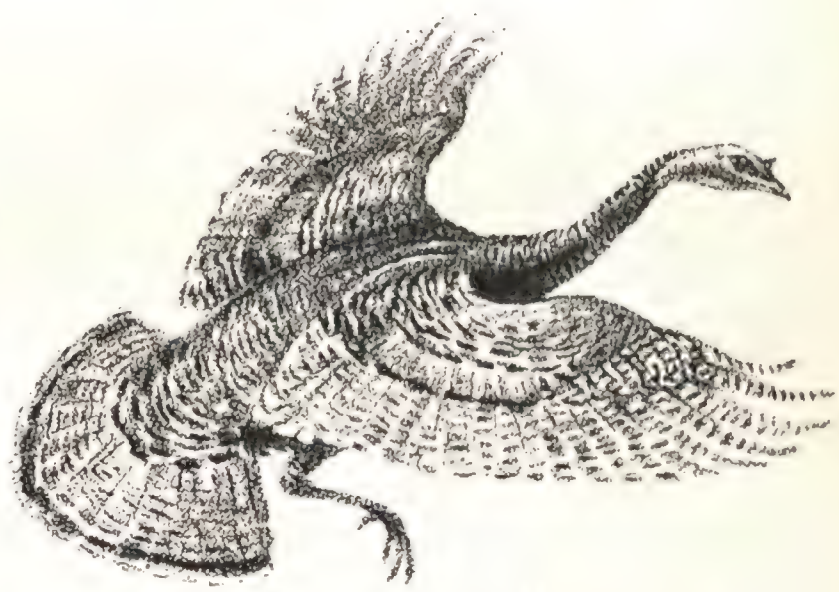
If this can happen in shrunken modern woodlands from growths of wildflowers covering only a few square feet, imagine the intensity of sweet odors in springtime a few centuries ago, when the whole coast consisted of woodland, and all was filled with blossoming wildflowers.

It may be hard to believe today, but when Henry Hudson sailed his *Half Moon* into New York he was delighted with the grass and flowers along the New Jersey side of the river and noted happily that "very sweet smells came from them."

Fish were enormous, abundant and easily taken. One man killed a sturgeon by wading into the water with an ax. Using bayonets, Lewis and Clark's men once got enough salmon to feed them. Indians caught big Southern catfish by diving into the water with any available red object for bait, seizing the fish as it approached and dragging it to shore.

The run of shad in rivers, whence they have since been excluded, was enormous. As the fish began to run up the Susquehanna, you could look downstream and see them coming. Washington fed his troops at Valley Forge when the shad began to run by sending cavalry upstream to roil up the water, while soldiers down below gathered in the fish. Shad were so plentiful that it was a little disgraceful to eat them at all. One naughty girl taunted a playmate, the child of poorer parents: "Your family eats shad!"

One early settler noted "divers sorte of shellfish, as scallops, muscles, cockles, lobsters, crabs, oysters and welks, exceeding good and very great." Since a few



Wild turkey, once abundant from Mexico to the northern woods, grew massive and meaty. Nearly wiped out, they are increasing again.

scattered Indians could not possibly use this abundance, all species grew to enormous size. Oysters had to be eaten in several mouthfuls. Lobsters are reported —"so large, so full of meate, and so plentifull in number, as no man will believe that hath not seene." A visitor was "some cloyed with them, they were so great and fat and lussious."

Not all the surprises were pleasant. One was the skunk. None of the early explorers had the least idea of the appalling powers of the American "woods pussy," when they first beheld that neat black-and-white little animal running about. Two Jesuit priests had the misfortune to find a skunk in occupation of their cabin. "I believe," wrote one of the dismayed fathers, "that the sin smelled by Sainte Catherine de Sienne must have had the same vile odor." John Josselyn, visiting America in the 17th century, wrote that "The Squnck is an offensive carrion." It was also

"of so strong a scent, that if it lights upon anything, there is no abiding."

Poor Josselyn met with something worse than the "squnck" and suffered severely because he knew so little about this primitive new country. When his ship approached the coast of Maine in 1638, he landed somewhere near Scarborough and "chanc't to spye a fruit as I thought like a pine Apple." Josselyn started to tear it from the tree—only to find a stream of indignant hornets or yellow jackets issuing furiously forth. They stung the poor fellow so severely that his companions could scarcely recognize his swollen features when he staggered back to the ship.

Nearly as painful were persimmons to other experimenters. One Englishman remarked: "If it be not ripe it will draw a man's mouth awry with much torment, but when it is ripe, it is as delicious as an Apricock."

*Dangers of jimsonweed*

A group of young Virginian soldiers gathered a mess of what must have been jimson (*i.e.,* Jamestown) weed for a "boil'd Salad." They were stricken with temporary insanity and what sounds like amnesia for 11 days. Perhaps there is some exaggeration in the only account that has survived, but Gray's *Botany* does describe the weed as "narcotic-poisonous." Pounded, it was used by certain West Coast Indians to make a ritual drink inducing visions among young men at puberty. Victims of it still turn up.

Curiously enough, poison ivy was no problem at all in early days. It likes plenty of light. When the land was thickly forested, the vines ran up the tree trunks and spread out at the top—as they still do if trees are thickly clustered. When the Europeans cleared the land, they gave poison ivy plenty of light along roads and in meadows. The plant spread everywhere, and we are still suffering—perhaps deservedly.

Early settlers gathering wild greens were careful to avoid possible poisoning. Housewives among the first settlers of Boonesborough, Kentucky, in the 1770s watched their cows in pasture and gave their families only greens they had seen the cows eat without harm.

On the whole there was little trouble with poisonous snakes. DeSoto marched his men through Florida and adjoining states when the whole area was certainly swarming with coral snakes and rattlers. Herpetologists suggest that the noise of a small army, its horses and the herd of pigs it drove along was enough to scare any snake away.

Philip Tome, the famous hunter of Lycoming County, Pennsylvania, once saw "a pile of rattlesnakes as large as an outdoor bake-oven. They lay with their heads sticking up in every direction, hissing." Indians sometimes raised their beds on forked sticks to keep the snakes out of the warm blankets; and two hunters in Pennsylvania, in about 1800, had to sleep in canoes anchored in midstream. There was a sensation in a rural congregation when a rattler was discovered crawling among the ankles of the worshipers; and, to make matters worse, the reptile had hardly been killed when another appeared. The sermon went on.

In spite of all, getting a living from this land was easy—if you knew how. The Pilgrim Fathers nearly starved in the winter of 1620-21—with teeming fisheries, abundant oysters, clams, crabs and lobsters at their doorsteps. Conrad Weiser, Shikellamy, the Iroquois chief, and a party of experienced woodsmen nearly perished crossing the "Endless Mountain" in Pennsylvania—but they tried it in winter, when everybody should have known there was no food.

Normally, game was ample and available. Wild turkeys, now rarely weighing more than 25 pounds, are said to have run up to 40 and 50—so fat they sometimes burst as they fell to the hunter's shot. Little Indian boys amused themselves by throwing sticks at them. In some parts of Pennsylvania flocks ran along the road. Passenger pigeons flew in such masses that the air currents they set up could be felt on the ground —though there were good sanitary reasons for keeping out from under such masses. Nobody shot them. You took them with nets. As for small game, a single hunting party once brought in 4,000 squirrels.

America is still a land of abundance, but it is a new kind of abundance. And in achieving it we have destroyed the old kind—the pure air, the clear lakes and streams, the game, most of the incomparable landscapes of the land as it was.

Northern kit fox was once plentiful on western plains. Settlement and ruthless killing by ranchers have driven it to the verge of extinction.

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# *Smithsonian highlights*

*Museum of Natural History*

"Greenland: Arctic Denmark" is an exhibit showing the past and present (see photographs) of this northern island largely surrounded by the Arctic circle. The history, culture, ecology and future economic development will be examined through photographs, maps and illustrated outlines. Opens January 15.

*(continued on page 76)*

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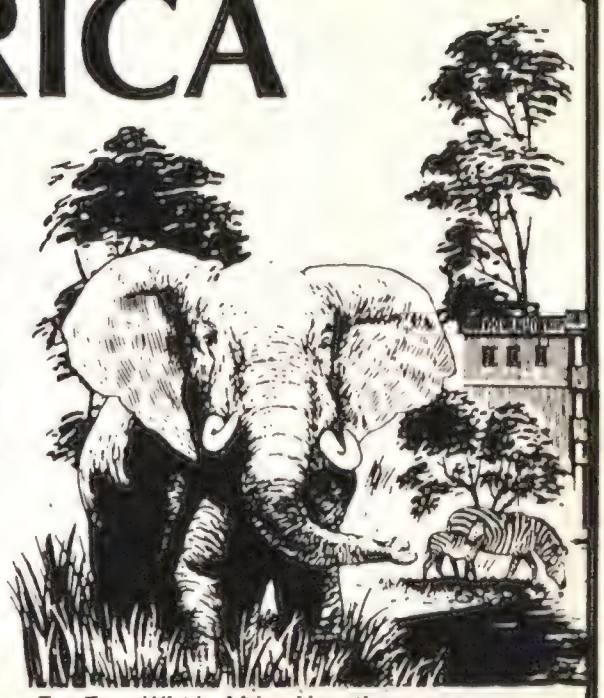

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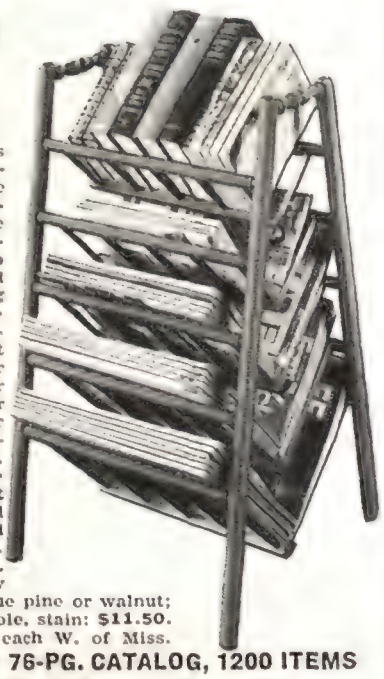

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## Tours for Associates

Study tours are designed as educational travel for members of the Smithsonian Associates. Smithsonian staff or other experts accompany all tours. For information, see below.

### Foreign Study Tours—1972

For information: Miss Bliss Shumann, Room 123 SI, Smithsonian Institution, Washington, D.C. 20560.

*Australia and New Zealand:* The tour will go via Fiji and return via Tahiti with visits to Canberra, the Australian Outback, Great Barrier Reef, Tasmania—March 24-April 27.

*Mexico and Guatemala:* A visit to historic sites of Yucatán, Oaxaca, Mexico City, Tikal and Antigua—April 3-21.

*"No Tour" Tour:* Dulles International Airport to Paris—May 29-June 19.

*Eastern Turkey in the Spring:* A tour to include Lake Van, Armenian churches, Trabzon and Istanbul—May 30-June 18.

*Greece and Yugoslavia:* A classical tour of Greek archaeological sites with a visit to Yugoslavia's Adriatic coast and inland sites—June 12-July 10.

*Educational Expedition:* Tour that will involve excavation of a middle Stone Age site at Ybedia, Israel—July 1-20.

*"No-Tour" Tour:* New York to Frankfurt—July 3-25.

*King Arthur's England*—July 11-August 1.

### Domestic Study Tours—1972

For information: Mrs. Patricia Kilkenny, Room 1208 A&I, Smithsonian Institution, Washington, D.C. 20560.

*Sturbridge Village, Massachusetts:* A Yankee winter weekend in the 18th-century atmosphere of this village—January 21-23.

*New Orleans, Louisiana:* A study of the Creole city's art, history and architecture—February 3-6.

*Death Valley National Monument:* A look at geology, climate, history in a desert region—April 14-20.

*Navaho Land, Arizona, New Mexico, Utah:* The past and present will be explored in the 25,000 square-mile Navaho Nation—May 21-28.

*Smithsonian Highlights*
*Continued from page 75*

*Weekend at the Smithsonian*
Created especially for national members of the Smithsonian Associates, April 21-23. Firsthand exposure to the Institution includes Friday evening cocktails and orientation dinner, tours guided by curators, Saturday evening option of theater or concert, choice of Sunday field trip to Chesapeake Bay Center or visits to selected galleries, and concluding reception with Smithsonian staff. Write Mrs. Patricia Kilkenny, Room 1208 A&I, Smithsonian Institution, Washington, D.C. 20560, for costs. Limited.

*Renwick Gallery*
This national showcase for American design, crafts and the decorative arts will open to the public on January 28. Named for its architect James Renwick, the gallery will open with eight concurrent exhibitions which will provide a sampling of American applied arts from traditional Indian pottery through contemporary furniture made by craftsmen in wood.

*Arts and Industries Building*
"Man's First Step on the Moon," a tapestry, designed by the French artist Mathieu Matégot and woven in the famous French tapestry manufacturing center of Aubusson, is on display in the Hall of Aerospace Art. The tapestry, an abstract design woven mainly of browns, buffs, tans and silver threads, is 13 feet high and 10 feet wide. The artist views the work as a symbol of the creative joining of science and art.

*Museum of History and Technology*
"Cast Iron and Tinplate Toys of Yesteryear (1880-1960)" includes a selection of toys from the Sears, Roebuck and Company American collection (see SMITHSONIAN, December 1971).

"Early Electrical Appliances," a collection of old household items including toasters, irons, fans and eggbeaters, is on exhibit in the Hall of Electricity.

"General Store Post Office" has been set up just as it was in Headsville, West Virginia, in the early 1860s and will operate as a post office with a postmaster in period costume stamping mail with Smithsonian postmark.

*Division of Performing Arts*
For ticket information on the following presentations, call 202-381-5395.

"Eureka," a fantasy based on discovery and invention, will be presented by the Alan Stevens puppet company through January. The original show, written especially for the

Smithsonian group, will be performed twice daily, Wednesday through Friday, and three times daily on weekends.

"Folk Concert," featuring Pam Ostergren performing old-time American banjo tunes and traditional ballads, will be presented by Performing Arts and the Folklore Society of Greater Washington. The concert will be on January 14 in the Museum of History and Technology Auditorium at 8:30 P.M.

Michael Lorimer, classical guitarist, will present a recital on January 14 co-sponsored by Performing Arts and the Washington Performing Arts Society in the Museum of Natural History Auditorium. Doors open 8 P.M.

*Associates Events*
"Music at the Smithsonian: Malcolm Bilson," co-sponsored by the Division of Musical Instruments and the Associates, will be presented on Monday, January 24, at 8:30 P.M. The program will include works by Haydn and Mozart in a concert for the Fortepiano using a Phillip Belt copy of the Smithsonian's 1773 instrument by Johann Andreas Stein. Doors open at 8:00 P.M.

*National Collection of Fine Arts*
"Karl Schrag" is an exhibition of 65 prints of the German-born artist, now 59, whose works have been widely shown in this country and Europe. His graphics reflect the artist's interpretation of the simple but elusive truths of nature. Opens January 7.

"John Steuart Curry (1897-1946)" presents a selective representation of four paintings and 20 drawings of this Midwestern regionalist.

"William H. Johnson (1902-1970)" includes 150 paintings, watercolors, drawings and prints in the first major museum exhibition accorded this black artist (see SMITHSONIAN, November 1971).

*Smithsonian Commons*
Luncheon facilities for staff, resident scholars and all members of the Smithsonian Associates are located in the original Smithsonian Building. Open weekdays from 11:30 A.M. to 2:00 P.M., the Commons offers a buffet luncheon from $1.25 to $1.75 upon presentation of a membership card.

*Freer Gallery of Art*
"Eugene and Agnes E. Meyer Memorial Exhibition" includes mainly Chinese bronzes, jades, sculpture, paintings and ceramics. Many of the 32 objects have not previously been exhibited.

"Court Designs and the Mass Production of Fine Arts in the Ottoman Empire," an illustrated lecture, will be given by Professor Walter B. Denny of the University of Massachusetts on January 11 in the Gallery auditorium. The lecture begins at 8:30 P.M.

Selected leaves from a collection of Armenian Manuscripts will be on display through January. Chosen from the Freer Gallery's collection of Biblical manuscripts, these leaves were chosen for their special artistic as well as scholarly interest. Also on exhibit will be religious and decorative objects in Byzantine style, including items from a gold treasure unearthed in Egypt 60 years ago.

*National Portrait Gallery*
"Washington from Banneker to Douglass: 1790-1870" is an exhibition that includes portraits, photographs and documents presenting the black community's view of the history of Washington, D.C.

"Model Hall," once the largest room in the United States, used to display patent models until 1932, is now open to the public. Clara Barton and Walt Whitman nursed Civil War soldiers there and Abraham Lincoln received guests in the rotunda during his second inaugural ball. "The Monarch Prints," a collection of portrait prints of rulers important to the history of America, is on exhibit.

*Traveling Exhibition Service*
Over 70 Smithsonian-sponsored exhibitions open each month throughout the United States and Canada. For a complete listing, write: Traveling Exhibition Service, Smithsonian Institution, Washington, D.C. 20560.

Chattanooga, Tennessee—"Paintings by Frederick J. Waugh" (Hunter Gallery of Art, January 1-30).

Long Beach, California—"Marsden Hartley: 99 Drawings" (Long Beach Museum of Art, January 15-February 13).

Worcester, Massachusetts—"Creative Printmaking in Pakistan" (Worcester Polytechnic Institute, January 1-30).

Memphis, Tennessee—"The Art of the Comic Strip" (Brooks Memorial Art Gallery, January 8-February 6).

Allentown, Pennsylvania—"Royal Buildings" (Allentown Art Museum, January 15-February 13).

Mobile, Alabama—"Royal Festivals and Romantic Ballerinas" (Mobile Art Gallery, January 15-February 13).

Jackson, Mississippi—"Just Before the War" (State Historical Museum, January 15 Feb. ruary 13).


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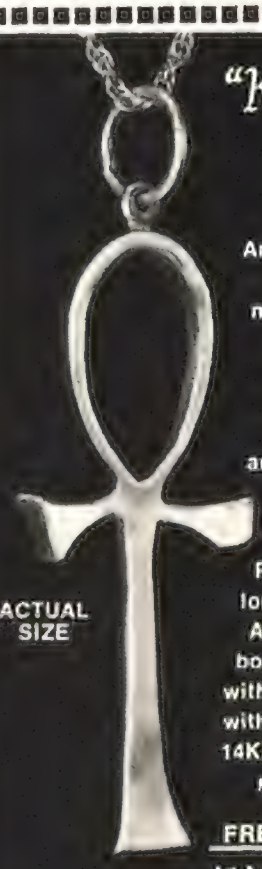

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# *Book reviews*

*A Sense of the Earth*
David Leveson
(Natural History Press, $6.95)

Here is a thoughtful book by a geologist, that presents a case for the earth as a wellspring of our being, to which we are fast losing the way.

In a simpler past, Man lived in close harmony with the planet which created, fed, clothed and sheltered him. It is one of the tragedies of modern times that urban man more and more finds himself cut off from his roots and thereby starved for the substance of his existence—oneness with the earth.

It is here that the geologist can help, if he chooses, for he bridges two worlds, as Leveson says: "the modern scientific world, with all its abstraction and complex tools, and the world of the actual earth, with its primitive substance and concrete being." So it is perhaps an even greater tragedy that geologists, of all people, are finding themselves lost in the same void of remoteness from the actual stuff of the earth, the natural object of all their science. For geology is changing.

There was a time when a geologist had a real sense of the earth, lived intimately with it in sun, dust and dirt with backpack and compass. And if the earth seemed endowed with infinite resources for Man's exploitation, it was also endowed with infinite wonder and beauty. Today the exploitation is well underway; the infinite resources have proved finite indeed—and as for the wonder and beauty?

Many of us "classical" geologists feel increasingly like canoeists, suddenly caught up in the noise and backwash of powerboats which race by—costing more, moving (where?) faster—but leaving us in a cloud of geospecialized exhaust, no longer able to see shore.

We see the young-and-coming professor who bustles about always "swamped—five papers underway." We see the department chairman who spends his time immersed in budgets and catalogs and grant proposals, leading to tons of sophisticated hardware valued in six digits—so that a new generation of geology students can spend *their* time plugged into showplace labs, bent over drafting tables or computer program cards. As Leveson says: "The extent to which direct contact by the senses is being replaced by indirect contact through gadgetry, bodes spiritual and ultimately scientific disaster."

This book, then, is a timely and sincere appeal, not only to modern Man but especially to the modern geologist, to reestablish a meaningful dialogue with the earth. It includes a brief and interesting overview of the development of geological thinking, an insight into conflicts, problems and back corners involved in geologists' attempts at self-definition, and

Polyanthophilophobia (fear of flower people) is the title of this item from *An Osborn Festival of Phobias,* by Robert Osborn and Eve Wengler (Liveright, $6.95). Here Osborn—who drew the cover of last October's SMITHSONIAN—runs a hilarious and frighteningly effective gamut of every imaginable human fear. Eve Wengler provides the derivations, no mean feat. As Arthur Miller notes in his introduction, "Osborn sticks to you." Obviously, we are all his phobias.

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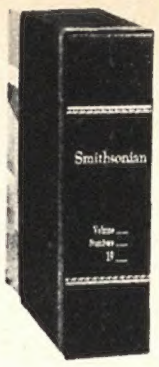


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a rich store of geological methods, puzzles and gropings toward solutions. Throughout it all runs the clear sense of the author's own joyful rapport with the earth as a source of unbounded perceptual delights and as the object of a fascinating discipline.

*—Barbara Blau Chamberlain*
Writer and geologist

*Notable American Houses*
Marshall B. Davidson
(American Heritage, $19.95)

It's too bad that large, hard-to-hold books like this one have a daunting effect on potential readers. Leafing through and looking at the pictures is easy, but can one actually start on page one and *read?* In this particular case, those who make that effort will be rewarded in several ways, for Marshall Davidson's text explores all the curious nooks and crannies of his sprawling subject.

And he and his picture editors have been very thorough: Besides covering each succeeding style of American house over three and a half centuries, they have included frontier cabins, monuments, office buildings, the public rooms of steamboats, saloons, resort hotels and tombs. There are also photographs and descriptions of such details as wrought-iron railings, pedimented doorways, fluted columns and carved balusters, all powerfully evocative of the age in which some anonymous craftsman made them.

In fact, as an evocation of the American past this book is hard to beat. To turn its pages is to flood the mind with dim, nostalgic memories. Here, for example, is a house in "stick style": Didn't Aunt Jane's summer place at Gloucester have those same angular gables and rickety-looking porches? Somewhere in our childhood, didn't we have the delight of ascending inside a mansarded turret such as that on Charles Crocker's San Francisco palace? And didn't we dream of bathing in a wood-paneled tub like the one in which Frederick Edwin Church luxuriated?

So it adds up to more than a record of architecture. It is a reflection of the many ways Americans have thought it appropriate to live: as transplanted English yeomen, as landed gentry, as merchant princes, as esthetes, as the most practical people in the world—and as the fussiest and fanciest. The way times and manners have changed is demonstrated over and over again. For example, the inventor of the revolver, Samuel Colt, named the house he finished in 1862 "Armsmere." What weapons tycoon would now be so ingenuous? (Napalm Hall? Bombsite?)

Grim photographs at the end show ruined landmarks, victims of neglect or the wrecker's ball. "To discard the past has been an act of faith in an illimitable tomorrow," say the editors. "But this attitude has also involved a downright indifference to houses and monuments of irreplaceable value. . . . As the rest may go, so will go precious aspects of our environment, to which, it is hoped, this book bears witness."

*—Mary Cable*
Author of *The Avenue of the Presidents*

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*By Patrick Ryan*

# *Milady's face—launched by a thousand jars*

Ever since Jezebel painted her face, dressed her hair and looked out at a window on the road-hogging Jehu, it has been a popular pastime of the masculine pompous to rail at the time and money women spend on beautification.

Hamlet made a niggling reference to it when he bade Horatio take poor Yorick's skull to my lady's chamber and tell her, let her paint an inch thick, to this favor she must come. Admiral Nimitz, in our time, epitomized the continuing campaign by explaining that a ship is always referred to as "she" because it costs so much to keep her in paint and powder. This theory found support this year when the stock market calculated that the total common stock of the ten largest companies in the American military-industrial complex, was some $4.7 billion, less than that of a single cosmetics firm, Avon, with about $5.6 billion.

Taken with the further financial fact that running expenditure on cosmetics in the United States alone exceeds five billion dollars a year, it is evident that although beauty may be only skin deep, it takes a seven-figure fortune to keep it even that thick.

My wallet echoes this view when I look along the serried ranks of bottles, jars, tubes and aerosols covering my wife's dressing table. She may not possess quite every hormone-enriched face-polish on the market, but she has certainly insured that I did my bit to keep Elizabeth Arden in racehorses and Helena Rubenstein in literary secretaries. We've got more skin food in the bedroom than we have eating food in the kitchen.

Olivier decorates himself for the part of King Lear and Tutankhamen hit the trail for the Great Beyond with less make-up than my wife needs to pop down to the supermarket to buy a foil-embalmed TV dinner. And at nightfall, when she goes into her 40-minute routine to prepare her face for bye-byes, a man can barely hear himself snore for the slurping of the lanolin. There can be no gainsaying, says my accountant, that but for the prodigious cost of keeping her in face-goo, I would be up there gossiping with the Gettys and hobnobbing around with the Onassii.

Despite my cosmetic-enforced poverty, I do not join the grumpy brouhaha against its cause. Mainly, of course, before the crockery starts flying, because its effect gives me the compensation of a beautiful mate. And also because I admire the courage shown by women in their dedication to appearing desirable. Down the years since Nefretete, the females of our species have bravely slapped just about everything malleable on their faces in an effort to improve on God's occasionally careless handiwork. In pursuit of beauty they have plastered their features with—but to name a few—barley flour, kohl, chalk, white lead, beeswax, bear's grease, vegetable mush, fruit whip, mineral oil, china clay, slack lime, river mud, spermaceti, wine, mutton fat, egg-and-bread crumbs, blood, frankincense and myrrh.

Physically, all this goes to little avail. The human skin is designed to exude, not to absorb, and the best any wonder cream can do is to keep it moist, a service which can be equally provided by massaging it with lard.

But spiritually, the goodies from the beauty counter are worth more to the ladies than their weight in gold. They're not just buying jars of face-goo, they're buying jars of dreams and spending more in a year, as the carpers deplore, than would serve to put two more men on the moon or keep the current war going for a few more weeks. The millions are better spent on vitaminized, rejuvenating miracle potions than on either of the other pointless projects. We may get by without multiplying munitions or men on the moon; but we die alive without dreams. Slapping on the foundation, smoothing in the eyelines and laying on the lipstick, our glamorously painted ladies are but joining in a communal dream of fair women.

Esthetically, the gallant female efforts insure that at least half of the human landscape is more pleasant to the passing eye than evolution has thus far crudely achieved. More's the pity that the male of the species lacks the pride to take equivalent steps toward self-improvement.

No need to overgild any lilies but just make some small essay to reduce the prevailing level of visual repulsiveness. Before any husband next bellyaches about the inordinate cost of female face-decoration, let him take a look around any masculine assembly and count the cheeks blotching, jowls hanging, chins trebling, eyebags drooping, brows jungling and noses purpling, and then consider whether men are right to leave all of nature's errors so nakedly on daily view.

As my wife replies when I inquire how anyone on earth can possibly spend all that cash on improving her facade—just take a look in the mirror, Buster.

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